

DOCUMENT RESUME

ED 349 956

IR 015 692

AUTHOR Engestrom, Yrjo
TITLE Interactive Expertise: Studies in Distributed Working Intelligence. Research Bulletin 83.
INSTITUTION Helsinki Univ. (Finland). Dept. of Education.
REPORT NO ISBN-951-45-6146-5; ISSN-0359-5749
PUB DATE 92
NOTE 114p.
AVAILABLE FROM Department of Education, University of Helsinki, Bulevardi 18, SF-00120 Helsinki, Finland.
PUB TYPE Information Analyses (070)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Behavioral Science Research; Cognitive Processes; *Communication Research; *Court Judges; Court Litigation; *Cross Cultural Studies; *Health Personnel; *Interaction Process Analysis; Mediation Theory; *Teamwork
IDENTIFIERS California; Distributed Cognition; *Expertise; Finland; Theory of Activity; Working Intelligence

ABSTRACT

The four studies presented show how expertise, from the cultural-historical theory of activity, is constructed interactively in everyday problem situations. They also demonstrate that purely situational analyses of discourse are insufficient as attempts to explain expertise. The four studies are presented as individual chapters: (1) Expertise as Mediated Collaborative Activity--a preliminary theoretical framework for the study of expertise as mediated collaborative activity; (2) The Tensions of Judging: Handling Cases of Driving under the Influence of Alcohol in Finland and California--a cross-cultural analysis of judicial expertise highlighting the multi-voicedness and internal tensions of expert work using tape recorded courtroom discourse; (3) Coordination, Cooperation, and Communication in Courts: Expansive Transitions in Legal Work--an analysis of expertise in a complex case of civil litigation in another California court setting using a court reporter's official transcripts of sidebar discussions as data on disturbances and innovations in the trial interactions; and (4) Twisting the Scripts: Heterogeneity and Shared Cognition in Multi-Professional Medical Teams--an analysis of expertise in multi-professional medical teams working in Finnish health centers which examines audio- and videotape recordings of their interactions using a three-pronged model of coordination, cooperation, and communication. Most of the 173 references listed are in English.
(ALF)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

ED349956

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

- ☐ This document has been reproduced as received from the person or organization originating it.
- ☐ Minor changes have been made to improve reproduction quality.
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.



Department of
Education

University of
Helsinki

RESEARCH BULLETIN 83

Yrjö Engeström

INTERACTIVE EXPERTISE

Studies in Distributed Working Intelligence

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

E. Neskanin

2

BEST COPY AVAILABLE

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)

12015692

RESEARCH BULLETIN 83

Yrjö Engeström

INTERACTIVE EXPERTISE

Studies in Distributed Working Intelligence

Helsinki 1992

3

ISBN 951-45-6146-5
ISSN 0359-5749
Helsinki 1992
Yliopistopaino

Yrjö Engeström

INTERACTIVE EXPERTISE: STUDIES IN DISTRIBUTED WORKING INTELLIGENCE

Abstract

Expertise has been understood as a property of an individual professional or craftsman. On the basis of the cultural-historical theory of activity, a radically different perspective is suggested. Expertise is here seen as an interactive accomplishment, constructed in encounters and exchanges between people and their mediating artifacts.

The report contains four studies. The first study (Chapter 1) is a preliminary theoretical framework for the study of expertise as mediated collaborative activity. The second study (Chapter 2) is a cross-cultural analysis of judicial expertise displayed in municipal courts handling cases of driving under the influence of alcohol in Finland and in California. In this study, the multi-voicedness and internal tensions of expert work are highlighted, using taperecorded courtroom discourse as data. The third study (Chapter 3) is an analysis of expertise in another court setting in California where a complex case of civil litigation was tried. This study focuses on disturbances and innovations in the trial interactions, using the official court reporter's transcripts of sidebar discussions as data. The data is analyzed with the help of a three-pronged model of coordination, cooperation and communication as fundamental forms of interaction. The fourth study (Chapter 4) is an analysis of expertise in multi-professional medical teams working in Finnish health centers. Videotaped and taperecorded meetings of multi-professional teams are analyzed with the help of the three-pronged model mentioned above.

The studies reported here show how expertise is constructed interactively in everyday problem situations. The studies also demonstrate that purely situational analyses of discourse are insufficient as attempts to explain expertise. The disturbances, innovations and transitions found in the data can be accounted for when analyzed within the framework of historically evolving activity systems and their inner contradictions.

Key words: expertise, activity, mediation, interaction, distributed cognition, working intelligence, coordination, cooperation, communication

Available from: Department of Education
University of Helsinki
Bulevardi 18
SF-00120 Helsinki
Finland
Tel.int. +358 0 1911
Telefax +358 0 1918073

CONTENTS

INTRODUCTION	1
1. EXPERTISE AS MEDIATED COLLABORATIVE ACTIVITY	3
2. THE TENSIONS OF JUDGING: HANDLING CASES OF DRIVING UNDER THE INFLUENCE OF ALCOHOL IN FINLAND AND CALIFORNIA	29
3. COORDINATION, COOPERATION, AND COMMUNICATION IN COURTS: EXPANSIVE TRANSITIONS IN LEGAL WORK	64
4. TWISTING THE SCRIPTS: HETEROGENEITY AND SHARED COGNITION IN MULTI-PROFESSIONAL MEDICAL TEAMS	79
REFERENCES	92

INTRODUCTION

Expertise has been understood as a property of an individual professional or craftsman. In this volume, I suggest a radically different perspective. Expertise is here seen as an interactive accomplishment, constructed in encounters and exchanges between people and their artifacts.

The volume contains four chapters. In the first chapter, I present a preliminary theoretical framework for the study of expertise as mediated collaborative activity. The second chapter is a cross-cultural study of judicial expertise displayed in municipal courts handling cases of driving under the influence of alcohol in Finland and in California. The third chapter is a study of expertise in another court setting in California where a complex case of civil litigation was tried. The fourth chapter is a study of expertise in multi-professional medical teams working in Finnish health centers.

The three empirical studies are examples of ongoing research in legal and medical expert work settings (see Engeström & al., 1989; 1990; Engeström, Haavisto & Pihlaja, 1992). Chapter 2 is based on a paper authored jointly by Yrjö Engeström, Kathy Brown, Ritva Engeström, Judith Gregory, Vaula Haavisto, Juha Pihlaja, Robert Taylor, and Chi-Cheng Wu, presented at the Annual Conference of the American Anthropological Association in New Orleans in November 1990. An elaborated version of this paper will appear in the volume *Cognition and Communication at Work*, edited by Yrjö Engeström and David Middleton (Cambridge: Cambridge University Press). Chapter 3 is based on a paper authored jointly by Yrjö Engeström, Kathy Brown, Carol Christopher, and Judith Gregory, presented at the Annual Conference of the Law and Society Association in Amsterdam in June 1991, and published in the October 1991 issue of *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition* (Vol. 13, Number 4, p. 88-97). Chapter 4 is based on a paper presented at the conference 'The Complex Social Problems and Psychology: Praxis, Common Sense, Hegemony', organized by Instituto Gramsci Emilia-Romagna and Maison des Sciences de l'Homme in Bologna in December 1991. Versions of this paper were also presented at the conference 'Expertise as Collaborative Activity', held in San Diego in December 1991, and at the First International Conference in the Memory of B. F. Lomov, held in Moscow in December 1991.

The studies presented in this volume should be seen as preliminary groundwork toward a cross-cultural research program on expertise as collaborative activity, particularly as it is manifested in teams and network

organizations. I thank the members of my research groups in San Diego and Helsinki without whom this volume would not have emerged. I also thank the Department of Education of the University of Helsinki for including this volume in its publication series. Comments received from individual colleagues are acknowledged at the end of each chapter.

Helsinki, April 1992

Yrjö Engeström

1. EXPERTISE AS MEDIATED COLLABORATIVE ACTIVITY

CARTESIAN APPROACHES TO EXPERTISE

In recent years, the cognitive bases of expertise have become a central problem of cognitive science and artificial intelligence. Despite important achievements in these fields, I will argue that our understanding of expert thinking and its formation at work is in need of a major transformation.

There is a pervasive dichotomy in our western culture concerning human thought. The dichotomy is expressed in number of related versions: analytical vs. intuitive; explicit vs. tacit; scientific vs. experiential; paradigmatic vs. narrative, and so on. Collins (1990) characterizes the two poles of the dichotomy as 'algorithmic' and 'enculturational'.

"We can contrast two models of learning: an 'algorithmic model,' in which knowledge is clearly statable and transferable in something like the form of a recipe, and an 'enculturational model,' where the process has more to do with unconscious social contagion." (Collins, 1990, p. 4)

In studies of expertise, the 'algorithmic' or human information processing approach was launched by Herbert Simon and his colleagues in studies of playing chess and solving physics problems (Newell & Simon 1972; Chase & Simon 1973; Simon & Simon 1978). Two representative collections of recent research continuing and expanding this tradition are *The Nature of Expertise*, edited by Chi, Glaser and Farr (1988), and *Toward a General Theory of Expertise*, edited by Ericsson and Smith (1991).

The emphasis of the approach has shifted somewhat from general mechanisms of perception, memory and problem solving to knowledge-based and domain-specific issues of expertise. Although the classical well constrained domains of chess and physics are still the core of experimental research, studies now include also laboratory simulations of real tasks of professional practice, chiefly in music, sports, medicine, law, and computer programming.

In their introductory chapter, Ericsson and Smith (1991) define the study of expertise as seeking to "understand and account for what distinguishes outstanding individuals in a domain from less outstanding individuals in that domain" (p. 2). They point out that the approach focuses on those cases where the outstanding behavior can be attributed to "relatively stable characteristics

of the relevant individuals" (p. 2). The study of expertise is basically identification or 'capturing' of superior and stable individual performances reproducible under standardized laboratory conditions. Given these requirements, it is no surprise that the most frequently studied form of expert performance is memory for meaningful stimuli from a well constrained task domain. Ericsson and Smith summarize the empirical findings of the human information processing approach to expertise as follows.

"The superior performance consists of faster response times for the tasks in the domain, where we include the superior speed of expert typists, pianists, and Morse code operators. In addition, chess experts exhibit superior ability to plan ahead while selecting a move (...). In a wide range of task domains experts have been found to exhibit superior memory performance." (p. 25-26)

In the overview of their volume, Glaser and Chi (1988, p. xvii-xx) summarize their view of the central findings of this approach in the form of seven points: (1) experts excel mainly in their own domains; (2) experts perceive large meaningful patterns in their domain; (3) experts are fast: they are faster than novices at performing the skills of their domain, and they quickly solve problems with little error; (4) experts have superior short-term and long-term memory; (5) experts see and represent a problem in their domain at a deeper (more principled) level than novices; novices tend to represent a problem at a superficial level; (6) experts spend a great deal of time analyzing a problem qualitatively; and finally (7) experts have strong self-monitoring skills.

In his concluding chapter to the Ericsson & Smith volume, Holyoak (1991, p. 303-304) puts together a fairly similar list: (1) experts perform complex tasks in their domains much more accurately than do novices; (2) experts solve problems in their domains with greater ease than do novices; (3) expertise develops from knowledge initially acquired by weak methods, such as means-ends analysis; (4) expertise is based on the automatic evocation of actions by conditions; (5) experts have superior memory related to their domains; (6) experts are better at perceiving patterns among task-related cues; (7) expert problem-solvers search forward from given information rather than backward from goals; (8) one's degree of expertise increases steadily with practice; (9) learning requires specific goals and clear feedback; (10) expertise is highly domain-specific; (11) teaching expert rules results in expertise; (12) performances of experts can be predicted accurately from knowledge of the rules they claim to use.

In contrast to the 'algorithmic' approach, the 'enculturational' approach to expertise sees thinking and knowledge as embedded in social situations, practices and cultures. Knowledge and thought cannot be divorced from the corresponding skills and actions. As Collins (1987, p. 331) points out, "an apprenticeship, or at least a period of interpersonal interaction, is thought to be the necessary prelude to the transfer of skill-related knowledge." The mastery exhibited by an expert is above all tacit and intuitive. It is based on

years of practical experience, not on teaching of verbalized concepts and explicit algorithms. A strong formulation of this approach was put forward by Hubert and Stuart Dreyfus (1986) in their *Mind over Machine* (see also Benner, 1984). A collection of research within this approach may be found in the volume *Knowledge, Skill and Artificial Intelligence*, edited by Göranzon and Josefson (1988). Proponents of this approach seek philosophical support in the works of Polanyi and late Wittgenstein (e.g., Nyíri & Smith, 1988).

The two approaches are commonly presented as mutually exclusive rivals. There is in fact one very conspicuous aspect in which they seem to represent opposing views, namely the explicitness or verbalizability of expert thinking and knowledge. For Dreyfus and Dreyfus (1986, p. 30), "an expert's skill has become so much a part of him that he need be no more aware of it than he is of his own body." For Glaser and Chi (1988, p. xx), "experts seem to be more aware than novices of when they make errors, why they fail to comprehend, and when they need to check their solutions." Dreyfus and Dreyfus see expert thinking as typically a nonsymbolic process, whereas Glaser and others seem to take some sort of symbolization for granted.

However, this difference is less absolute than it first seems. Robert Hamm (1988) points out that the degree of explicitness and verbalization, as well as the use of analytical or intuitive mode of thinking, are dependent of the task at hand. Tasks of lonely problem solving in a familiar domain are often accomplished without externally noticeable symbolic means. Tasks requiring negotiation and agreement between members of a team can hardly be accomplished without some sort of explicit symbolic means.

Whatever importance the differences between the two approaches may have, their fundamental similarities are striking. These similarities have been largely overlooked in the literature, probably because they are mainly taken as self-evident by proponents of both approaches. They may be expressed in the form of three central propositions. I will formulate these three ideas polemically. The first part of each proposition is a positive statement, the latter part expresses a negative implication of the first part.

1. Expertise is universal and homogeneous. The basic features of expertise in general are culturally and historically invariant cognitive mechanisms. The aim is to identify 'the expert' in a given field. There is no need to differentiate between alternative, substantively and culturally different types of expertise.
2. Expertise consists of superior and stable individual mastery of discrete tasks and skills. The understanding of expertise does not require that a more encompassing social context of practice is taken as a unit of analysis.
3. Expertise is acquired through internalization of experience, gained gradually by massive amounts of practice in the skills exhibited by the

established masters of the given specialty (the famous novice-master continuum). Expertise does not include questioning or reconceptualizing the skills and knowledge of established masters, nor the generation of culturally novel models of practice.

These three are core ideas of a Cartesian view which depicts the mind as a lonely, enclosed clockwork (see Markova, 1982). Cartesianism goes hand in hand with technocentrism and with an inability to conceptualize the creation of new culture. As Collins (1990, p. 82) points out, the problem comes from treating expertise as a property of the individual rather than interaction of the social collectivity, for "it is in the collectivity that novel responses become legitimate displays of expertise."

In the following, I will assess critically each of the Cartesian assumptions about expertise and present a set of alternative assumptions. First, however, it is important to point out that in various branches of studies of cognition, technology and work, the limits of Cartesianism are currently being questioned. Two examples will suffice to demonstrate this.

AT THE LIMITS OF CARTESIANISM

In his recent book on human errors, James Reason (1990) differentiates between *active errors* that have almost immediate effects and *latent errors* whose consequences may lie dormant with the system for a long time. The former are associated with the performance of 'front-line' operators while the latter are typically associated with design, decision-making, construction, management and maintenance.

"Detailed analyses of recent accidents (...) have made it increasingly apparent that latent errors pose the greatest threat to the safety of a complex system. In the past, reliability analyses and accident investigations have focused primarily upon active operator errors and equipment failures. While operators can, and frequently do, make errors in their attempts to recover from an out-of-tolerance system state, many of the root causes of the emergency were usually present within the system long before these active errors were committed." (Reason, 1990, p. 173)

Reason offers an analogy between latent failures in complex systems and 'resident pathogens' in the human body. Complex systems contain built-in weaknesses or potentially destructive agencies.

"The resident pathogen notion directs attention to the indicators of 'system morbidity' that are present prior to a catastrophic breakdown. These, in principle, are more open to detection than the often bizarre and unforeseeable nature of the local triggering events." (Reason, 1990, p. 198)

These ideas take human error research close to its limits. The focus is shifted from individual operators and equipment components to entire organizations and systems of production. However, the notion of resident pathogens is only

an analogy, borrowed from medicine. It is not yet a conceptual tool suited for analyses of latent failures. An exciting new vision is opened - but the lack of adequate theoretical instruments leaves the reader in a state of mild disappointment.

In a new paper, Rob Kling (in press) asks why applications of computer-supported cooperative work (CSCW), or 'groupware', have been so slow to be adopted. He points out that a key dilemma lies in the CSCW movement's reliance on positively loaded terms, like 'cooperation' and 'collaboration,' to characterize work - and an effective taboo in examining conflict, control, coercion, and contradiction in work settings. This taboo makes many CSCW analyses unable to understand the actual uses of groupware.

Kling demonstrates that the dominant latent theory of CSCW researchers depicts work as "the integration and harmonious adjustment of individual work efforts towards the accomplishment of a larger goal" (Ellis & al., 1991, p. 43). Kling suggests that researchers should examine a variety of social relationships in workplaces - cooperative, conflictual, competitive, etc. - in order to create more realistic images of the likely uses of the CSCW systems.

Kling's analysis takes CSCW research close to its limits. The focus is shifted from groupware technologies and idealized collaborative groups to the social relationships and structures of entire organizations. But again, the conceptual tools are not yet there.

Even the CSCW movement, in spite of its emphasis on cooperation, has largely been a prisoner of the Cartesian idea of the individual mind as the fundamental unit of analysis, regarding cooperation simply as 'harmonious adjustment of individual work efforts.' Without stating it explicitly, both Reason and Kling point toward the need to overcome the confines of Cartesianism in the study and development of human work.

EXPERTISE IS HETEROGENEOUS AND MULTI-VOICED

Proponents of Cartesian approaches to expertise speak confidently of 'the expert chess player', 'the expert physicist', etc. The existence of different concurrent and historically successive schools of expertise in the given field is tacitly disregarded. Yet even in chess there are different approaches, schools, or cultures of playing. It is these very differences, implying the possibility of clashes and hybrids between qualitatively distinct approaches, that make a field of expertise dynamic. Recall the excitement of the world championship games between Robert Fisher and Boris Spasski, representing two entirely different cultures of chess.

Glaser (1987, p. 92) has recently admitted that his "picture of expertise is probably biased by the highly structured domains in which it has been studied, and the demands of situations in which cognitive expertise has been analyzed." Glaser refers to the distinction made by Hatano and Inagaki (1983) between 'routine expertise' and 'adaptive expertise'. This may be regarded as an important departure from the notion of universal expertise. But it still remains formal, detached from the substantive cultural contents of expertise.

Holyoak (1991, p. 304-309) lists an impressive number of empirical inconsistencies and theoretical anomalies found in cognitive research on expertise. These make the validity of supposedly universal characteristics of expertise highly questionable: "there appears to be no single 'expert way' to perform all tasks" (Holyoak, 1991, p. 309). Holyoak's own suggestion is to rebuild theories of expertise on the connectionist approach in cognitive science, combined with aspects of more traditional theorizing on symbolic representation. While connectionist network models offer a promising possibility to account for the formal mechanisms behind the diversity and flexibility of individual expert performances, again they say nothing about the origination and importance of the different substantive theories and collective orientations, or points of view held by experts.

In a paper on judicial decision-making, Jeanette Lawrence cautiously challenges the universality of expertise from a more content-oriented angle.

"The expert judge represents each new case against his or her acquired frames of reference or constructions of reality. (...) People's implicit cognitions are not usually represented together in the same model as the procedural steps that they take to solve specific problems. We need to describe how an expert's *a priori* perspectives operate in interaction with procedures for making sense of data and generating solutions." (Lawrence, 1988, p. 230)

Lawrence introduces the crucial factor of 'frames of reference' in order to show how the judges define a problem space, set limits on what it contain, and focus attention on its features. The frame of reference contains the judge's sentencing objectives, view of offense, personal role definition, and penal philosophy.

There are two key issues involved here. The first issue is whether the frames of reference are truly alternative qualitative orientations or just different stages or steps on a single path toward 'complete' expertise. Supposing that frames of reference are indeed true qualitative alternatives, the second issue is whether the different frames of reference entail also qualitatively different procedures of problem solving and decision-making. Lawrence's findings give no answers to these issues. Instead of analyzing alternative types of expertise as suggested by herself, she ends up comparing novices and experts much in the spirit of dominant approaches.

Lawrence discusses the frames of reference in terms of personal styles. In passing, she notes that the notion of frame of reference "picks up the way *shared* values and outlooks place certain constructions on reality for professional and cultural groups" (Lawrence, 1988, p. 231, italics added). The universality of expertise becomes much more questionable if we take seriously the deeply cultural and social nature of the qualitative differences in expert thinking. Jay Katz takes up this aspect in his discussion of physicians' coping with uncertainty.

"The public, and professionals as well, need to become more aware of the fact that many disparate groups now live under medicine's tent. Contemporary medicine is not a unitary profession but a federation of professions with differing ideologies and senses of mission. This diversification has changed medical practices." (Katz, 1984, p. 189)

David Tuckett takes the heterogeneity argument one step further. His book on doctor-patient interaction is appropriately titled *Meetings between Experts* (Tuckett & al., 1985). The title refers to the fact that in a consultation both the doctor and the patient bring in a certain kind of expertise. The doctor knows medicine, the patient knows his or her own life and pain. Without something like a merger of these two viewpoints and resources, a successful consultation will not happen. While this is well known to everybody involved, the doctor's formal status and traditional stance tend to exclude and invalidate the patient's expertise. In challenging situations, the familiar voice of authority will ask 'Who is the expert here?' So while lay persons or clients represent types of expertise of their own, their contribution and participation in expert activity is problematic and full of tensions.

The heterogeneity of expertise may be captured with the help of the notions of dialogicality and 'multivoicedness' of human cognition (Bakhtin, 1981; Bibler, 1983/84; Markova & Foppa, 1990; Todorov, 1984; Wertsch, 1991). To put it simply, expertise in any given field is an ongoing dialogue or polyphony of multiple competing and complementary viewpoints and their respective 'instrumentalities', repertoires of mediational means. The various voices represent 'social languages' rooted in different societal positions, ideologies and traditions of practice. This multivoicedness is both a resource for collective achievement and a potential source of fragmentation and conflict.

But it is not only a question of diversification, or co-existence of competing contemporary schools, viewpoints and positions within fields of expert activity. There is also a historical dimension to be observed. Competing schools of thought and viewpoints originate in different historical periods and conditions. Old traditions persist and modify themselves. In this sense, alternative frames of reference may be analyzed as if historical layers of expertise, to be identified by an 'archeology of expert knowledge'. Competing and contradictory historical layers of expert thought can regularly be discovered within one and the same organization, and often within the actions and thoughts of one and the same individual practitioner.

Is this diversification and historical change limited to frames of reference - or are also cognitive procedures of expert thinking and problem solving subject to historical change?

Shoshana Zuboff suggests that there is a pervasive historical transition taking place in the very core of expert cognitive procedures. She argues that traditional forms of industrial, clerical and professional work foster and require a specific type of skills which she calls *action-centered*. These skills exhibit the following characteristics (Zuboff, 1988, p. 61).

1. *Sentience*. Action-centered skill is based upon sentient information derived from physical cues.
2. *Action-dependence*. Action-centered skill is developed in physical performance. Although in principle it may be made explicit in language, it typically remains unexplicated - implicit in action.
3. *Context-dependence*. Action-centered skill only has meaning within the context in which its associated physical activities can occur.
4. *Personalism*. It is the individual body that takes in the situation and an individual's actions that display the required competence. There is a felt linkage between the knower and the known. The implicit quality of knowledge provides it with a sense of interiority, much like physical experience.

According to Zuboff, computerization of work brings about a crisis in action-centered skills and an emergence of a new type of *intellective* skills. In intellective skills, meaning is constructed explicitly, on the basis of analyzing symbolically mediated information, typically the electronic text.

"The demands of constructing meaning from a symbolic medium diminish the salience, or even the possibility, of a shared action context. Without a context in which meanings can be assumed, people have to articulate their own rendering of meaning and communicate it to others. Indeed, the very activity of constructing meaning often necessitates a pooling of intellective skill in order to achieve the most compelling interpretation of the text. (...) When people confront the electronic text and ask the questions, 'What's happening? What does this mean?' the answers, whether in the form of an interior dialogue or in a conversation with others, will be in the medium of language. (...) The proper interpretation of data as they appear on a video screen is rarely self-evident. In my observations, the interpretations developed by operators and managers were actively constructed in dialogue and joint hypothesis testing." (Zuboff, 1988, p. 196-197)

In spite of its oversimplified dichotomous character, Zuboff's account presents a strong case for the changing nature of the cognitive skills involved in expertise. It seems that both the frames of reference and the cognitive procedures of experts are non-universal and historical.

EXPERTISE RESIDES IN COLLECTIVE ACTIVITY SYSTEMS

So far, I have argued for heterogeneity of expertise. This could easily be misinterpreted as merely a plea for acknowledging individual differences in experts' orientations. Much more is at stake, however. The fundamental question is: Where does expertise reside?

Dominant Cartesian approaches take it for granted that expertise resides under the individual's skin, in the form of explicit or tacit knowledge, skills and cognitive properties that enable one to display superior performances in the given field. Thus, *performing a discrete task alone and without external aids* is seen as the proper unit of analysis. This definition contains three interrelated aspects: (a) the object-related aspect of discrete tasks, (b) the social aspect of loneliness, and (c) the artifact- and tool-related aspect of single-handed performance.

The larger context of expert performance leaks into mainstream discussions chiefly in two forms. Firstly, there is always the issue of 'external constraints' or 'environmental constraints', such as time, amount and quality of information available, and the like (Lawrence, 1988). Secondly, there is the issue of motivation (Posner, 1988). It is somewhat disturbing to realize that the dominant traditions say practically nothing about the factors that make experts learn and perform their discrete tasks in the first place. Attempts at an alternative approach based on the notion of 'psychic energy' are stuck at the same individualist level of analysis, positing the exceptional individual "who might have been born with an unusual sensitivity to some domain of experience" as the locus of creative expertise (Csikszentmihalyi, 1988, p. 166).

According to Glaser and Chi (1988, p. xix), when experts face and analyze a task, they 'add constraints to the problem'. The authors cite the study of Voss and Post (1988) on solving ill-defined economic problems, using as an example a problem where subjects were asked to find solutions to the low agricultural production in what used to be the Soviet Union.

"By elaborating the initial state of the problem, the experts identified possible constraints, such as Soviet ideology and the amount of arable land. (Adding constraints, in effect, reduced the search space. For example, (...) considering the constraint of the Soviet ideology precluded the solution of fostering private competition - a capitalistic solution.)" (Glaser & Chi, 1988, p. xix-xx)

Reducing the search space - or reducing the context of thinking - seems to work fine in stable conditions where tasks are standardized and problems have constant 'correct solutions'. In the case of Soviet agriculture, the 'ideological constraint' so confidently added by the experts has recently evaporated in rapid societal transformation. In other words, in changing and unpredictable conditions, narrowing down the search space may actually lead to a cognitive

constraints are taken for granted and reinforced. Charles Perrow (1984) analyzes a series of cases where unexpected and intertwined multiple failures in complex technological systems were met with narrowing down the search space by the experts - with catastrophic results, like in the Three Mile Island nuclear power plant. Jay Katz adds an important observation from medicine.

"Specialization tends to narrow diagnostic vision and to foster beliefs in the superior effectiveness of treatments prescribed by one's own specialty. This effect of specialization is reflected in the contemporary treatment of most diseases." (Katz, 1984, p. 188)

In novel situations of uncertainty, the lonely, unaided and narrowly task-oriented expert appears helpless and sometimes dangerous. Non-standard problems and disturbances seem to be outside his or her field of control. The unit of analysis adopted by the dominant approaches to expertise supports and reproduces this helplessness.

Drawing on the cultural-historical theory of activity initiated by Vygotsky (1978) and Leont'ev (1978; 1981), I will use the *mediated activity system* as my basic unit of analysis. The notion of mediation is crucial here. An activity system comprises the individual practitioner, the colleagues and co-workers of the workplace community, the conceptual and practical tools, and the shared objects as a unified dynamic whole. A model of an activity system is presented in Figure 1.1.

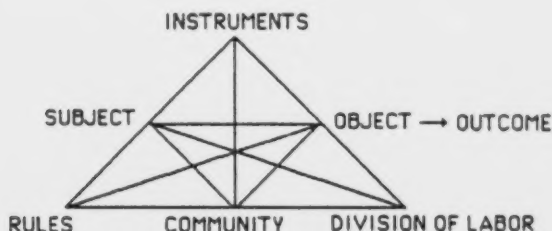


Figure 1.1: Model of a socially distributed activity system (Engeström, 1987, p. 78)

The model reveals the decisive feature of *multiple mediations* in activity. The subject and the object, or the actor and the environment, are mediated by instruments, including symbols and representations of various kinds. This, however, is but 'the tip of an iceberg', depicted as the uppermost sub-triangle of Figure 1.1. The less visible social mediators of activity - rules, community, and division of labor - are depicted at the bottom of the model. Between the components of the system, there are continuous transformations. The activity system incessantly reconstructs itself.

An activity system is much more competent and robust than any of its individual expert members. Similar views of work, cognition and expertise as artifact-mediated, socially distributed activity have recently been discussed by Bodker & Gronbaek (in press), Bowers & Middleton (1991), Goodwin & Goodwin (in press), Hutchins (1990), Hutchins & Klausen (in press), Raeithel (in press), Star (in press), Suchman (in press), and others, although usually without explicating the generic structure of activity in such detail as in Figure 1.1 above. Howard Becker's (1982; 1986) sociological ideas are also close to my approach.

An activity system does not exist in a vacuum. It is but a node in a multi-dimensional network of activity systems (Figure 1.2). Its relevant 'neighbour activities' include *firstly* the activities where the objects and outcomes of the central activity are embedded (let's call them object-activities). *Secondly*, they include the activities that produce the key instruments for the central activity (instrument-producing activities). *Thirdly*, they include activities like education and schooling of the subjects of the central activity (subject-producing activities). *Fourthly*, they include activities like administration and legislation (rule-producing activities). *Fifthly*, they include activity systems essentially similar to the central activity. Some of those are regarded as in some respects more advanced than the central activity. These and other activities which are in some way, for a longer or shorter period, connected to the given central activity, potentially destabilize each other through their exchanges and inter-penetrations.

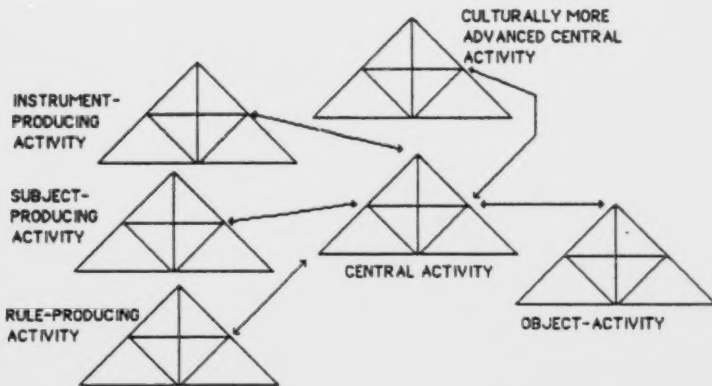


Figure 1.2: A simplified network of human activity systems (Engeström, 1987, p. 89)

EXPERTISE IS LEARNING WHAT IS NOT YET THERE

Within dominant Cartesian approaches, expert learning is uniformly described in the form of the famous continuum from novice to expert. Apprenticeship-like gathering of practical experience under the guidance of masters is offered as the basic form of acquiring expertise. Chase and Simon (1973, p. 279) summarize this view in their study of chess masters.

"The organization of the Master's elaborate repertoire of information takes thousands of hours to build up, and the same is true of any skilled task (e.g., football, music). That is why *practice* is the major independent variable in the acquisition of skill."

Ericsson and Smith (1991) point out that ten or more years of full-time practice are required to attain an 'international level of performance' in a variety of skills, such as chess, music, or professional sports.

This enthusiastic belief in the blessings of extensive practical experience may be contrasted with John Dewey's (1910, p. 148) remarks on the dark side of experience.

"Mental inertia, laziness, unjustifiable conservatism, are its probable accompaniments. Its general effect upon mental attitude is more serious than even the specific wrong conclusions in which it has landed. Wherever the chief dependence in forming inferences is upon the conjunctions observed in past experience, failures to agree with the usual order are slurred over, cases of successful confirmation are exaggerated. Since the mind naturally demands some principle of continuity, some connecting link between separate facts and causes, forces are arbitrarily invented for that purpose."

A contemporary version of these observations is crystallized in the notion of 'skilled incompetence', offered by Chris Argyris (1986; 1991).

"Put simply, because many professionals are almost always successful at what they do, they rarely experience failure. And because they have rarely failed, they have never learned how to learn from failure. So whenever their single-loop learning strategies go wrong, they become defensive, screen out criticism, and put the 'blame' on anyone and everyone but themselves. In short, their ability to learn shuts down precisely at the moment they need it the most." (Argyris, 1991, p. 100)

This troublesome observation leaks into mainstream discussion through the findings of research in behavioral decision theory.

"In many studies, experts do not perform impressively at all. For example, many expert judges fail to do significantly better than novices who, at best, have slight familiarity with the task at hand." (Johnson, 1988, p. 209; see also Brehmer, 1980)

The studies Johnson refers to deal with probabilistic judgment and decision-making under uncertainty. There is also evidence that novices may be superior to experts in dealing with sudden changes in the task (Hendrick, 1983). Our own research on novice and expert janitorial cleaners (Engeström &

Engeström, 1986) suggests that established mastery is questionable yet in another respect. The novice cleaners performed better than expert cleaners in tasks requiring reasoning about the goals and systemic features of the entire work activity and its organization. The experts outperformed the novices in discrete routine tasks.

The dominant Cartesian approaches reproduce the conservatism of experience-based expertise by sticking to the consensus criterion of expert solutions: "generally, a solution is regarded as good if other solvers find little wrong with it and think it will work" (Voss & Post, 1988, p. 281). This stance effectively rules out novel, unorthodox, and therefore suspect solutions.

Dewey was not satisfied with pointing out the dark side of experience. He was keenly aware of the double-edged, internally contradictory nature of practical experience.

"In short, the term *experience* may be interpreted either with reference to the *empirical* or the *experimental* attitude of mind. Experience is not a rigid and closed thing; it is vital, and hence growing. When dominated by the past, the custom and routine, it is often opposed to the reasonable, the thoughtful. But experience also includes the reflection that sets us free from the limiting influence of sense, appetite, and tradition." (Dewey, 1910, p. 156)

Phrased differently, we need to distinguish between *internalization* of the culturally given and *externalization* of novel ideas, artifacts, and patterns of interaction. Both belong to experience and practice - when practice is understood as meaningful collective activity, or *praxis*, not only as individual rehearsing of discrete skills.

People do become good at various tasks and in various domains by gradually internalizing already invented knowledge and procedures. But this is only half of the story. World chess champion Garri Kasparov has certainly spent thousands of hours studying various past games, their positions and best moves. But while he internalized the culture of chess, he also contributed to its dramatic transformation. He not only internalized the existing wisdom, he also questioned it and created entirely new chess culture. He was a rebel and threat in the orthodox Soviet chess world. His ideas and actions gained momentum and were materialized into novel patterns of collective praxis. These parallel processes of internalization and externalization may be schematically depicted with the help of Figure 1.3.

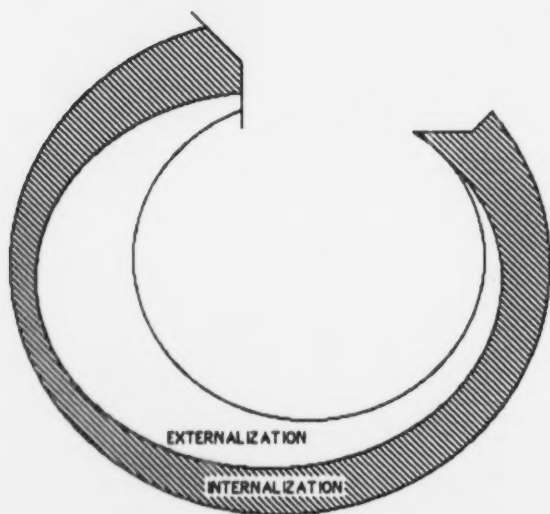


Figure 1.3: The parallel processes of internalization and externalization

In Figure 1.3, a developmental cycle of expert activity begins with almost exclusive emphasis on internalization, on socializing and training the novices to become competent members of the activity as it is routinely carried out. Creative externalization occurs first in the form of discrete individual deviations and innovations. As the disruptions and contradictions of the activity become more demanding, internalization takes increasingly the form of critical self-reflection, and externalization, search for novel solutions, increases. Externalization reaches its peak when a new model for the activity is envisioned, designed and implemented. As the new model becomes consolidated, internalization of its inherent ways and means again becomes the dominant form of learning and development.

At the level of collective activity systems, such a developmental cycle may be seen as the equivalent of the zone of proximal development, discussed by Vygotsky (1978) at the level of individual learning. A key feature of developmental cycles is that they are definitely not predetermined courses of one-dimensional development. What is more advanced, 'which way is up', cannot be decided using externally given fixed yardsticks. Those decisions are made locally, within the expansive cycles themselves, under conditions of uncertainty and intensive search. Yet they are not arbitrary decisions. The internal contradictions of the given activity system in a given phase of its evolution can be more or less adequately identified, and any model for future

which does not address and solve those contradictions will eventually turn out to be non-viable.

As I pointed out above, an activity system is by definition a multi-voiced formation. A developmental cycle is a re-orchestration of those voices, of the different viewpoints and approaches of the various participants. Historicity in this perspective means identifying the past cycles of the activity system. The re-orchestration of the multiple voices may be dramatically facilitated when the different voices are seen against their historical background, as layers or segments in a pool of complementary competencies within an activity system.

Most research and theorizing on learning has focused exclusively on internalization of the given. However, mastery of qualitative transformations and reorganizations of work activities has become the true challenge to expertise in practice.

Against this background, the crucial learning in expert activity systems is learning what is not yet there. This the famous issue of bootstrapping in human learning and development (Bereiter, 1985), now seen in a collective scale. An activity system deeply involved in its inner contradictions will not find relief by looking for established masters who could tell the practitioners what model to adopt for the future. There are no such masters. When this is realized, learning becomes a question of joint creation of a zone of proximal development for the activity system. The needed new model must be internalized in the very process of generating and externalizing it. In other words, learning becomes a venture of designing, implementing and mastering the next developmental stage of the activity system itself. A similar view of learning as 'progressive problem solving' and 'working at the edge of one's competence' has recently been suggested by Bereiter and Scardamalia (in press), although still limited to the level of an individual subject.

In this framework learning becomes above all a question of generating a model for the future activity as well as the associated conceptual and practical tools, organizational patterns, and rules. In other words, learning becomes a venture of designing, implementing and internalizing the next developmental stage of the activity system itself.

There are important intermediate phases in a developmental cycle of an activity system. The activity system moves from 'business as usual' to an unarticulated 'need state' and then to a stage of increasingly aggravated inner tensions (double bind; see Bateson & al., 1972) which eventually threaten the very continuity of the activity. Parallel to the failures, conflicts and tensions, there are individual innovative attempts to overcome the limitations of the present organization. At some point, efforts are made to analyze the situation, which often further sharpens the double bind. In the midst of regressive and evasive attempts, there emerges a novel 'germ cell' idea for the reorganization

of the activity in order to solve its aggravated inner contradictions. This idea gains momentum and is turned into a model. The model is enriched by designing corresponding tools and patterns of interaction. The new model is implemented in practice, producing new conflicts between designed new ways and customary old ways of working. By working through these conflicts, the designed or *given new* model is replaced by the *created new* model, firmly grounded in practice.

These idealized and simplified phases of a developmental cycle are depicted in Figure 1.4. The two-headed arrows signify the iterative, non-linear character of the process.

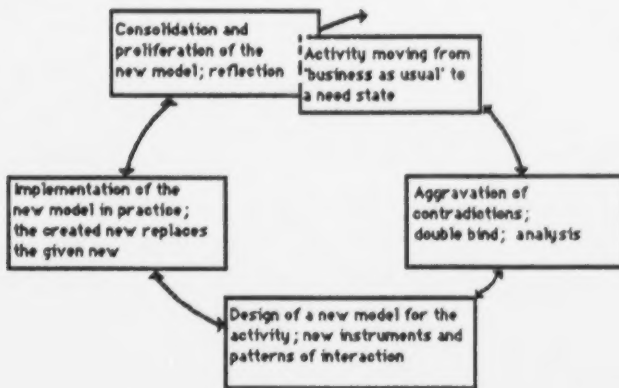


Figure 1.4: Phases of a developmental cycle (Engeström, 1987, p. 189)

The developmental cycle has an expansive character. Expansion has several facets. First, through the expansive cycle the activity system reconceptualizes its object and outcome, putting the in a new, wider context. In other words, the practitioners ask what they are doing and why, not just how they are doing it. Second, the expansive cycle starts out with a few individuals acting as spearheads of change, but leads to a movement or a bandwagon that involves the entire community and eventually affects several related activity systems (on movements and bandwagons, see Kling & Iacono, 1988; Fujimura, 1988; Zald & Berger, 1978). Finally expansion implies diversification of the initial model into various applications and modifications, often substantially different from and critical toward the initial model.

THERE ARE INTERNAL CONTRADICTIONS IN EXPERT ACTIVITY SYSTEMS

Cartesian approaches to expertise are obsessed with superior performances and extraordinary skills. They are also obsessed with the stability of such performances and skills (Ericsson & Smith, 1991).

If mastering transformations of activities is acknowledged as an increasingly crucial characteristic of expertise, stable superior performances appear relatively uninteresting. Failures, breakdowns and innovations become much more interesting. For the researcher this means leaving the elitist world of superior individuals and entering the mundane world of everyday troubles in collective settings.

Symptomatically enough, in studies of work, mistakes, disturbances, failures and disasters have attracted the attention of researchers for quite a while. One of the pioneers was the sociologist Everett Hughes (1951) who took up the significance of mistakes at work. Continuing Hughes' lead, Riemer (1976) showed that many mistakes in construction work are quite inevitable in the given structural conditions. In medicine, there is an important body of literature on such mistakes and failures (e.g., Bosk, 1980; Strauss & al., 1985).

This structural or, more appropriately, contextual and cultural-historical embeddedness of seemingly arbitrary and irrational troubles at work has subsequently been analyzed from various viewpoints (e.g., Turner, 1978; Perrow, 1984; Hargrove & Glidewell, 1990; Reason, 1990). Along with studies of major disasters, an increasing amount of research is being done on less spectacular disturbances, misunderstandings and conflicts, particularly in work settings requiring intensive communication between experts and clients (e.g., West, 1984; Grimshaw, 1990; Conley & O'Barr, 1990; Coupland, Giles & Wiemann, 1991).

In everyday troubles, one should distinguish between open *discoordinations* or *disturbances* of interaction, latent or hidden *ruptures* of intersubjective understanding, and *dilemmas* within thought and discourse. In addition, there are *innovations*, situations and action sequences where actors attempt to go beyond the standard procedure in order to achieve something more than the routine outcome.

By *discoordinations* or *disturbances* I mean deviations from the normal scripted course of events in the work process, normal being defined by plans, explicit rules, or tacitly assumed traditions. A *discoordination* may occur between two or more people, or between people and artifacts, or between people, artifacts and natural conditions. A *discoordination* takes the form of an obstacle, difficulty, failure or conflict (for a striking example of such *discoordinations*, see Whalen, Zimmerman & Whalen, 1988).

By ruptures I mean blocks, breaks or gaps in the intersubjective understanding and flow of information between two or more participants of the the activity. Ruptures don't ostensibly disturb the flow of the work process, although they may lead to actual discoordination or mistakes. Ruptures are thus found by interviewing and observing the participants 'off line', outside or after the 'on-line' interaction.

Dilemmas in the discourse and thought of individuals and collectives have been analyzed by Billig and his collaborators (Billig, 1987; Billig & al., 1988). The authors point out the importance of hedges, reservations, qualifications and hesitations as symptoms of deeper dilemmas.

"The presence of contrary themes in discussions is revealed by the use of qualifications. The unqualified expression of one theme seems to call forth a counter-qualification in the name of the opposing theme. There is a tension in the discourse, which can make even monologue take the form of argumentation and argument occur, even when all participants share similar contrary themes. (...) The dilemmatic aspects do not only concern contrary ways of talking about the world; they exist in practice as well as in discourse. Above all, the dilemmatic aspects can give rise to actual dilemmas in which choices have to be made." (Billig & al., 1988, p. 144)

To account for the generation of everyday failures and innovations, I must return to the notion of activity system as the unit of analysis. As I showed above, an activity system does not exist in a vacuum. It interacts with a network of other activity systems. For example, it receives rules and instruments from certain activity systems (e.g., management), and produces outcomes for certain other activity systems (e.g., clients). Thus, influences from outside 'intrude' into the activity systems. However, such external forces are not a sufficient explanation for surprising events and changes in the activity. Direct mechanical causation cannot be identified. The outside influences are first appropriated by the activity system, turned and modified into internal factors. Actual causation occurs as the alien element becomes internal to the activity. This happens in the form of imbalance and tension. The activity system is constantly working through tensions and contradictions within and between its elements. In this sense, an activity system is a virtual disturbance- and innovation-producing machine.

The primary contradiction of activities in capitalist socio-economic formations lives as the inner conflict between exchange value and use value within each element of the triangle of activity. A hypothetical work activity of general practitioners in primary medical care may serve as an illustration. The primary contradiction, the dual nature of use value and exchange value, can be found by focusing on any of the elements of the doctor's work activity. For example, *instruments* of this work include a tremendous variety of medicaments and drugs. But they are not just useful preparations for healing - they are above all commodities with prices, manufactured for a market,

advertised and sold for profit. Every doctor faces this contradiction in his daily decision making, in one form or another.

The secondary contradictions are those appearing between the elements. The stiff hierarchical division of labor lagging behind and preventing the possibilities opened by advanced instruments is a typical example. A typical secondary contradiction in this work activity would be the conflict between the traditional biomedical *conceptual instruments* concerning the classification of diseases and correct diagnosis on the one hand and the changing nature of the *objects*, namely the increasingly ambivalent and complex problems and symptoms of the patients. These problems more and more often do not comply with the standards of classical diagnosis and nomenclature. They require an integrated social, psychological and biomedical approach which may not yet exist.

The tertiary contradiction appears when representatives of culture (e.g., teachers) introduce the object and motive of a culturally more advanced form of the central activity into the dominant form of the central activity. For example, the primary school pupil goes to school in order to play with his mates (the dominant motive), but the parents and the teacher try to make him study seriously (the culturally more advanced motive). The culturally more advanced object and motive may also be actively sought by the subjects of the central activity themselves. A tertiary contradiction arises when, say, the administrators of the medical care system order the practitioners to employ certain new procedures corresponding to the ideals of a more wholistic and integrated medicine. The new procedures may be formally implemented, but probably still subordinated to and resisted by the old general form of the activity.

The quaternary contradictions require that we take into consideration the essential 'neighbour activities' linked with the central activity which is the original object of our study. Quaternary contradictions are those that emerge between the central activity and the neighbouring activity in their interaction. Conflicts and resistances appearing in the course of the 'implementation' of the outcomes of the central activity in the system of the object-activity are a case in point. Suppose that a doctor, working on such a new wholistic and integrated basis, orders or suggests that the patient shall accept a new habit or conception and change his way of life in some respect. The patient may react with resistance. This is an instance of the quaternary contradictions. The patient's way of life or his 'health behavior' is here the object-activity. If patients are regarded as abstract symptoms and diseases, isolated from their activity contexts, it will be impossible to grasp the developmental dynamics of the central activity, too.

The four levels of contradictions may now be placed in appropriate locations in the schematic network of activities presented earlier in this chapter (Figure 1.5).

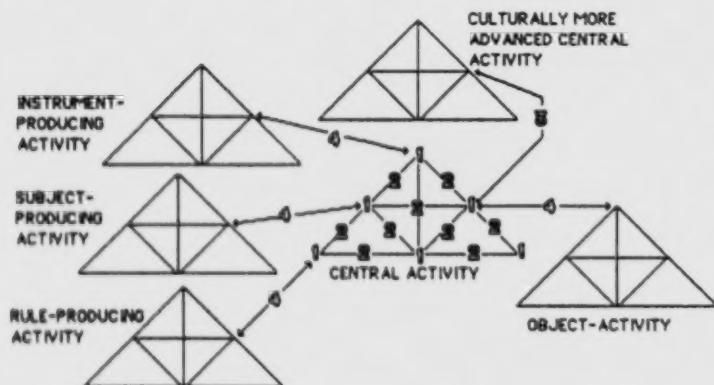


Figure 1.5: Four levels of contradictions in a simplified network of human activity systems

Level 1: Primary inner contradiction (double nature) *within* each constituent component of the central activity.

Level 2: Secondary contradictions *between* the constituents of the central activity.

Level 3: Tertiary contradiction *between* the object/motive of the dominant form of the central activity and the object/motive of a culturally more advanced form of the central activity.

Level 4: Quaternary contradictions *between* the central activity *and* its neighbour activities.

Contradictions are not just inevitable features of activity. They are "the principle of its self-movement and (...) the form in which the development is cast" (Ilyenkov, 1977, 330). This means that new qualitative stages and forms of activity emerge as solutions to the contradictions of the preceding stage of form. This in turn takes place in the form of 'invisible breakthroughs'.

"In reality it always happens that a phenomenon which later becomes universal originally emerges as an individual, particular, specific phenomenon, as an exception from the rule. It cannot actually emerge in any other way. Otherwise history would have a rather mysterious form.

Thus, any new improvement of labour, every new mode of man's action in production, before becoming generally accepted and recognised, first emerge as a certain deviation from previously accepted and codified norms. Having emerged as an *individual exception* from the rule in the labour of one or several men, the new form is then taken over by others, becoming in time a

new universal norm. If the new norm did not originally appear in this exact manner, it would never become a really universal form, but would exist merely in fantasy, in wishful thinking." (Ilyenkov, 1982, p. 83-84)

EXPERT ACTIVITY SYSTEMS ARE IN HISTORICAL TRANSITION

In recent years, there has been an intensive discussion on the alleged crisis or breakdown of so called Fordist forms of mass production and on the emergence of post-Fordist modes of flexible specialization. Without entering this debate in any depth, one can safely observe that teams and networks are gaining increasing importance as forms of organizing work. The success of the Japanese economy is often associated with those forms. In core industries such as automobile factories round the world, the 'team concept' is being adopted and experimented with (MacDuffie & Krafcik, 1989; Womack, Jones & Roos, 1990). In vital services such as health care and social work, multiprofessional teams proliferate (Callicutt & Lecca, 1983; Lecca & McNeil, 1985a; Pritchard & Pritchard, 1992). Management teams and networks are becoming a central feature of both private corporations and public organizations. There is an abundance of enthusiastic literature advocating the virtues of teams and networks (e.g., Charan, 1991; Hackman, 1990; Heany, 1989).

However, teams are also problematic. Peter Senge (1990, p. 24) characterizes the situation as follows.

"All too often, teams in business tend to spend their time fighting for turf, avoiding anything that will make them look bad personally, and pretending that everyone is behind the team's collective strategy - maintaining the *appearance* of a cohesive team. To keep up the image, they seek to squelch disagreement; people with serious reservations avoid stating them publicly, and joint decisions are watered-down compromises reflecting what everyone can live with, or else reflecting one person's view foisted on the group. If there is disagreement, it's usually expressed in a manner that lays blame, polarizes opinion, and fails to reveal the underlying differences in assumptions and experience in a way that the team as a whole could learn."

Ancona (1991, p. 1) points out the same dilemma.

"The increased use of teams is a two-edged sword. The rhetoric in the popular press often stresses the positive side. Teams are seen as the key to success in Japan and as a means of restoring American competitiveness: a mechanism to increase commitment, improve productivity and quality, and provide flexibility in a changing environment. On the negative side, both common lore and current research show that teams often face process losses; the whole is less than the sum of its parts. (...) Researchers have found that new product and process development teams intended to improve time to market are often far less effective than expectations of foreign comparison would have predicted."

A closer look at the literature reveals sets of conflicting, even diametrically opposite assessments and claims about the adoption of teams and networks as frameworks for organizing work. There are three levels to this dilemma:

(1) At a general level of policy formation, there are strong claims arguing for the superior efficiency, motivational value and emancipatory implications of teams (e.g., Rosow, 1986); at the same time, there are equally strong claims maintaining that teams are a new mode of exploitation and control, of 'management by stress' (e.g., Parker & Slaughter, 1988; Mumby & Stohl, 1991).

(2) At the level of interprofessional relations, there are findings and claims that speak for teams as means of enhancing cross-professional collaboration and flexibility; at the same time, there are findings and claims that speak of violent turf struggles between professions in teams (e.g., Erde, 1982; Lecca & McNeil, 1985b).

(3) Finally at the level of problem solving and learning, there are findings and claims that speak of tremendous cognitive benefits gained in teamwork; at the same time, there are findings and claims that warn of the danger of increased conformism and stagnant 'groupthink' in teams (e.g., Janis, 1985).

Underneath the surface of general value-laden, often outright ideological proclamations for and against the 'team concept', there is actually very little concrete research on cognitive and communicative processes within and between teams in real organizational contexts. The bulk of the available empirical literature consists of decontextualized experimental studies on supposedly universal psychological dynamics of small groups. These traditional studies aim at finding laws of group behavior that are independent of cultural and institutional specifics. Only quite recently has a new wave of research emerged. Cognitive scientists, anthropologists and sociologists have begun to develop approaches to teams and networks that take the cultural and organizational context as an integral constitutive aspect of the phenomena to be explained.

This emerging new wave of research is partly inspired by the new information technologies that are dramatically altering the technical possibilities of intellectual collaboration in work (e.g., Galegher, Kraut & Egido, 1990; Greenbaum & Kyng, 1991; Greif, 1988). On the other hand, the new wave is inspired by a number of related theoretical and methodological approaches (Lave & Wenger, 1991; Resnick, Levine & Teasley, 1991). These include symbolic interactionism, distributed artificial intelligence, ethnomethodology, discourse analysis, and the cultural-historical theory of activity (for a comparative discussion, see Star, *in press*). These different approaches find common ground in discussions of culturally situated, socially distributed and artifact-mediated cognition in 'communities of practice' (e.g., Engeström & Middleton, *in press*).

It is vitally important that the rigorous micro level analyses launched by the new wave characterized above be brought into contact with macro level economic and sociological interpretations of the current transformations in work and organizations (e.g., Cole, 1989). In concrete research, teams and networks have surfaced time and again as transitional forms, representing something in the 'grey area' between dominant rationalized work organization and emerging, historically new organizational patterns. This general historical hypothesis may be schematically depicted as follows (Figure 1.6).

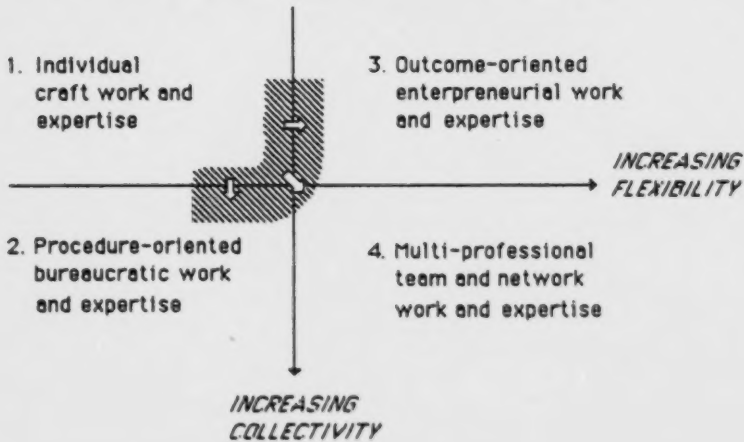


Figure 1.6: Fields of historical transition in expertise

In Figure 1.6, field number one represents the historically oldest currently observable layer of work and expertise: craft. Fields two and three represent the two alternative main directions of rationalizing work: hierarchy and market, or bureaucracy and entrepreneurship, respectively. Field four represents team and network -based organization of work and expertise. This field is "neither market nor hierarchy", as Powell (1990) succinctly put it (see also Thorelli, 1986). The grey zone represents historical movement from craft to the three other organizational modes, along the lines of increasing flexibility on the one hand and increasing collectivity on the other hand. The grey zone is an area of constant disturbances, ruptures and innovations from below. There is an ongoing struggle between competing organizational options. Notice that the direct gateway from field one to field four is very narrow, indicating the probability that team and network solutions do not usually emerge in 'pure form' but rather by long 'detours' through and in mixtures with hierarchy and market forms of organization.

The historical hypothesis sketched in Figure 1.6 above expresses the assumption that there are identifiable qualitative differences between the emerging team and network-based organization on the one hand and currently predominant hierarchy and market types of organization on the other hand. However, this does not mean that I expect all teams and all networks to be automatically representatives of a qualitatively new type of work organization.

According to Leont'ev (1978), the decisive *differentia specifica* that enables us to identify an activity system is the object to which it is directed. Accordingly, historical types of activity systems should differ from each other above all in their relationship to their objects. The crucial characteristic of team and network-based work organization is therefore not the external form of interconnected work groups but the way these groups conceive of the objects of their work. The external forms are important preconditions and symptoms of the emergence of the new - but not its essence.

Walter Powell argues that the rise of network organizations is indeed based on the emergence of a new type of objects which he calls 'intangible assets.'

"Networks (...) are especially useful for the exchange of commodities whose value is not easily measured. Such qualitative matters as know-how, technological capability, a particular approach or style of production, a spirit of innovation or experimentation, or a philosophy of zero defects are very hard to place a price tag on. They are not easily traded in markets nor communicated through a corporate hierarchy." (Powell, 1990, p. 304)

Powell's point receives support from studies on informal know-how trading between competitors in innovative industries (von Hippel, 1987). The Japanese models of producing innovations by means of intricate networks represent a more deliberate approach to the same potentials (Imai, Nonaka & Takeuchi, 1985).

Deborah Ancona's recent studies suggest how teams may formulate a new, expanded conception of the objects of their work. Ancona (1991) found three different strategies teams developed toward their environment: informing, parading, and probing. The informing team had a primary goal of creating an enthusiastic team with open communication among members - but with a low level of interaction with clients. The parading teams wanted to obtain visibility among clients or within the organization. Finally the probing teams opted for high levels of two-way communication with the external environment. They emphasized diagnoses of the clients' needs and feedback on team ideas.

"They did not use existing member knowledge alone to map their external environment; members were encouraged to take on new perspectives and bring in new data. These teams had the highest level of external contact, were aggressive not only in testing potential interventions but also in actually implementing new programs, and convinced people in both the field and top management that they were doing a good job." (Ancona, 1991, p. 7-8)

Teams with their meetings and internal dynamics have a strong tendency of turning inward and encapsulating themselves. In this process they often substitute their objects in the outside world with 'pseudo-objects', or layers of talk, artifacts and 'busywork' that function as blankets covering and muffling the objects. The probing strategy confronts this tendency. Such a strategy seems to be a crucial precondition if teams are to constitute active nodes in a network. In activity-theoretical terms, the probing strategy aims at constant reconceptualization and expansion of the object of activity. The object is not seen as consisting of separate fixed tasks or items to be acted upon in a one-way manner. The object is viewed as interconnected tasks embedded in their respective activity systems that have to be understood and interacted with.

Teams are often characterized as vehicles for collective and innovative learning. They are potentially units that learn by continuously going beyond the information given.

"Autonomous groups are learning systems. As their capabilities increase, they extend their decision space. In production units they tend to absorb certain maintenance and control functions. They become able to set their own machines. The problem-solving capability increases on day-to-day issues. They negotiate for their special needs with their supply and user departments. As time goes on, more of their members acquire more of the relevant skills. Yet most such groups allow a considerable range of preferences as regards multi-skilling and job interchange." (Trist, 1981, p. 34)

Networks are described in a similar vein.

"One of the key advantages of network arrangements is their ability to disseminate and interpret new information. Networks are based on complex communication channels. (...) they are particularly adept at generating new interpretations; as a result of these new accounts, novel linkages are often formed. This advantage is seen most clearly when networks are contrasted with markets and hierarchies. Passing information up or down a corporate hierarchy or purchasing information in the marketplace is merely a way of processing information or acquiring a commodity. In either case the flow of information is controlled. No new meanings or interpretations are generated. In contrast, networks provide a context for learning by doing. As information passes through a network, it is both freer and richer; new connections and new meanings are generated, debated, and evaluated." (Powell, 1990, p. 325)

These characterizations seem to be overly simplified. Ancona points out that the three strategies she found in teams imply qualitatively different modes of learning.

"Informing is similar to learning about the outside world through contemplation; if you leave us alone to think and discuss, we will tell you what you need when we have figured it out. Parading is similar to learning through observation. The message here is that we want to watch you, to understand you, and to let you know that we are around to respond to your needs. Finally, probing (...) occurs through experimentation, trying out a new idea and seeing the reaction, making an intervention and evaluating the result." (Ancona, 1991, p. 9)

While useful, Ancona's categories are still rather metaphorical. In analyses of work and learning, a crucial theoretical question is how to combine the

subject-object and the subject-subject, or the instrumental and the communicative, aspects of the activity.

The vision of current transformation in expert activities presented above can best be concretized and tested by means of detailed analyses of team and network activities in various local work settings and cultural contexts. It is a task for concrete research to find out what kinds of novel learning processes actually emerge in different teams and potential network settings, and how such novel forms may inform the development of education and training. In the following three chapters, three such empirical case studies are presented. The first two studies (chapters 2 and 3) deal with legal expertise in American and Finnish court settings. The third study (chapter 4) deals with medical expertise in primary health care settings in Finland.

2. THE TENSIONS OF JUDGING: HANDLING CASES OF DRIVING UNDER THE INFLUENCE OF ALCOHOL IN FINLAND AND CALIFORNIA¹

INTRODUCTION

In this paper, I will analyze legal work conducted in municipal courts, taking the work and expertise of the judge as my point of departure. I will use data from two different cultural settings: a municipal court in a mid-sized city in Finland, and a municipal court in a large city in southern California. I will restrict my analysis to the handling of cases of driving under the influence of alcohol (DUIA, or DUI for short). In both cultures, these are considered common, simple and routine cases.

There is, however, a marked difference in the general attitudes toward drunken driving in these two cultures. In California, drunken driving is defined as a misdemeanor, and in legal practice it is not regarded as a serious offense. As Gusfield (1981, p. 140) observes, "in day-to-day enforcement and adjudication DUIA is treated *as if*, like other traffic offenses, it is the normal behavior of motorists." In Finland, drunken driving is a crime, quite clearly distinguished from other traffic violations in legal practice. In both cultures there is political pressure toward introducing tougher laws. However, as Ross (1991, p. 157; see also Ross, 1989) points out, "contrary to North America, temperance movement and worry about the alcohol problem are a significant political force in Finland." (For extended analyses of DUI as a social and criminological phenomenon in the American society, see Gusfield, 1981; Jacobs, 1989).

Courts are intimately connected to our notions of power. Judges are almost emblems of ultimate secular authority. Several authors have studied how professional experts, such as judges, may effectively suppress the concerns and dialects of their lay clients. Such analyses of the asymmetrical power relations between professionals and their clients (e.g., O'Barr, 1982; Harris, 1989) illuminate an important aspect of interaction in courts. However, such analyses do not focus on the work of the experts themselves. Far from being straightforward exercise of power, the work of judges is internally multifaceted and contradictory. In this paper, I will focus on the multiple dialects, disturbances and tensions in the work of judges, interpreting those features as dynamic possibilities of learning, change and development.

The data for this paper were collected in 1990. The data from Finland are from a case example taken from a large database consisting of complete sets of official case documents, videotaped court hearings, and audiotaped interviews of the judge and other relevant participants in a number of different criminal and civil cases from two municipal courts located in mid-sized cities. The data from southern California consist of audiotaped court hearings and complementary field notes as well as audiotaped interviews with the judge and a team of public defenders. The case analyzed in this paper is one chosen from 53 DUI cases, the hearings of which we recorded during one week in the court. In both settings, my research teams spent a considerable amount of time in the field, getting acquainted with the local officials and customs. While the analyses reported in this paper are limited exploratory case studies, they are also part of ongoing interaction with the courts in question.

JUDGES - REFEREES, INQUISITORS, OR MORE?

Susan Philips (1990) has recently pointed out that in much of the social-scientific literature on courts, the American trial judge is either invisible or cast in the role of a rather passive referee who assures that procedural law is followed. This corresponds to the notion that there are two basic types of legal procedures: the Anglo-American 'adversarial' system and continental European 'inquisitorial' system. According to that notion, continental European judges question witnesses from each side of the case and are generally much more active and dominant in the hearing than their American counterparts.

Philips herself challenges such a dichotomy and provides evidence of American trial court judges taking more active and versatile roles than the standard referee notion would predict (Philips, 1990; see also Yngvesson & Mather, 1983). While I endorse this argument, I would like to inquire further into the contents, characteristics and contextual prerequisites of such versatility in the judge's work.

Hogarth (1971) and others (e.g., Gibson, 1978; KcKnight, 1981) have shown that there are important substantive differences in judges' 'penal philosophies' and 'role orientations' within one and the same culture. On the other hand, Philips' (1990, p. 208) observes that "a single third-party intervenor may employ the strategies of more than one [...] kind of remedy agent, depending on the situation." In other words, one approach (Hogarth and others) has identified a variety of relatively discrete philosophies or viewpoints among judges, while the other approach (Philips) contributes the idea of multiple parallel roles used by one expert. When these ideas are brought together, we get a picture of the judge employing several complementary but possibly also contradictory substantive strategies or orientations in managing the complex trajectory of a court case.

The notion of *voices* (e.g., Silverman & Torode, 1980; Mishler, 1984; Wertsch, 1990) is particularly suited for the analysis of varieties of talk in organizations, reflecting various underlying normative orders and social positions. Conley and O'Barr (1990) have recently used the notion of voices in their analysis of discourse in informal courts. According to them, most voices are eventually silenced in the legal process and "the purported voice of legal authority is in fact the voice of social power (Conley & O'Barr, 1990, p. 170)." Conley and O'Barr found, however, that within the voice of legal authority, judges differ in their orientations. They identified five orientations: (1) the strict adherent to the law, (2) the law maker, (3) the mediator, (4) the authoritative decision maker, and (5) the proceduralist. The orientations manifest themselves in talk. In this paper, such qualitatively different ways of talking within the voice of legal authority will be called *dialects*.

Conley and O'Barr point out that there is considerable discord in informal courts. They mention several sources of discord, all associated with the litigants' expectations that the court cannot meet. These discordances are described as dissonances between the ideologies of the litigant and the judge. While such dissonances may certainly be seen in the data of Conley and O'Barr, this may be an unnecessarily restricted account of the nature of discord in courts. In most courts there are multiple parties and participants whose complex interactions may give rise to various kinds of communicative glitches, errors, breakdowns, and conflicts. In this paper, all such deviations from the formally expected smooth script of the court procedure will be called *disturbances*.

Complexity is here the key issue. Heydebrand and Seron (1990; see also Seron, 1990) present a compelling account of the rationalization of American courts in the 20th century as a response to the tension between growing caseloads and shrinking resources. According to Seron, the dominant developmental trend in courts has been "from traditional-professional case processing with the focus on adjudication to technocratic case processing with the focus on administration (Seron, 1990, p. 462)." This has important implications for the judge's work. First, the traditional division between judicial and nonjudicial, professional and clerical labor is giving way to a new, emergent organizational model that relies on teamwork between judge, magistrate and law clerk. Secondly, judges are increasingly urged and trained to "think of the court as an organizational and coordinated 'system' in which they are encouraged to take a proactive posture toward pretrial and to encourage and raise settlement when appropriate (Seron, 1990, p. 462)."

What kinds of effects will the development described by Heydebrand and Seron have on the nature of the judge's expertise? It may be hypothesized that the more intricate the division of labor in the processing of a court case, the more likely it is that the judge will have to employ and combine various

parallel dialects and the greater the likelihood of numerous systemic disturbances requiring repair and proactive measures from the judge. The present study is an inquiry into these two issues.

THE COURTS AS ADMINISTRATIVE AND PHYSICAL SYSTEMS

The two municipal courts from which I take my examples are quite different administratively and physically. The following description is necessarily sketchy and greatly simplified.

The court located in Finland (hereafter referred to as the Finnish court) employs 16 judges. The court is divided into eight departments of which all but two handle both civil and criminal cases. Different types of cases have different combinations of judicial personnel handling them, all the way up to the 'full composition' of three judges. Driving under the influence of alcohol is a routine criminal case, handled in this court by one judge and a clerk, occasionally also by a judge intern (a law school graduate acquiring his or her judge's qualification by serving an internship in a court). Only a year earlier DUI cases were still handled by the full composition of three judges. After we collected our data, the rationalization has proceeded further and all routine criminal cases not requiring the full composition are now handled by one department only.

In simple cases such as DUI, the judge commonly dictates and compiles the court minutes while he or she conducts the hearing; the clerk may keep notes but those are usually only supporting material. The judge uses the original police report in which the defendant's story (along with the arresting officer's account) is recorded in a narrative form as a key component of the minutes. The prosecutor's complaint, also in a free narrative form although more condensed and formal, is another key component of the minutes.

The court has no jury institution in the American sense. In certain types of cases (not in DUI cases), lay members participate in the hearing, but in practice they have little input in the actual decision-making. Also it is quite common that in simple cases such as DUI, the defendant uses no defense attorney but represents him- or herself. There is a system of municipal public defenders, and the court may grant a free trial to a person with limited financial means. There is no plea bargaining in Finnish courts.

The Finnish penal code differentiates between DUI cases involving driving under the influence and those involving severe or gross driving under the influence. The lower limits of punishable blood alcohol level are .05 and .15 percent, respectively. The judges use a simple unofficial table to standardize the sentences. According to the table, when the blood alcohol level is between .05 and .10 percent, the sentence will be 20 to 30 daily fines and four to seven

months suspension of the driver's licence. When the blood alcohol level is between .10 and .149, the sentence will be 30 to 50 daily fines and five to eight months suspension of the driver's licence. The amount of the daily fine is determined progressively, on the basis of the defendant's taxable monthly income. In 1989, the court gave verdicts in 290 cases of driving under the influence and 333 cases of severe driving under the influence. The caseload of the court is not excessive. There is an atmosphere of relative tranquility, tradition and stability.

The layout of the Finnish courtroom used in the DUI hearing analyzed in this paper is depicted in Figure 2.1.

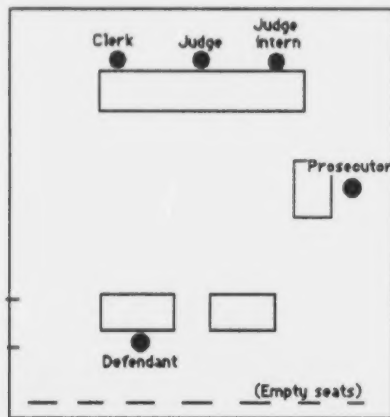


Figure 2.1: The physical layout of the Finnish courtroom

The first noticeable feature in Figure 2.1 is that there are only five people in the courtroom. As is usual in these cases, the defendant used no defense attorney. There is no audience. In the back of the room, there are empty seats that could be used by spectators, but in a regular DUI case there are very seldom any. The authority of the court is not very strongly emphasized by the physical setup. Each participant, including the defendant, sits at a desk. The defendant also answers questions sitting down. The judge's bench is somewhat higher and more massive than the other desks and there is a large open Bible on a stand attached to the front of the bench (it is used when witnesses give their oaths; nobody touched it in this hearing). On each desk, there is a fixed microphone, for the purpose of taperecording the hearings. The judge wears no special outfit. In this case, the judge was a male, wearing a regular gray suit. The judge intern, also male, wore a sweater and a tie.

The court located in southern California (hereafter referred to as the California court) is a separate part of the municipal court, called Traffic Arraignment Court. It is located in a different part of the city than the main municipal court building. It is the court that handles exclusively traffic misdemeanors; felonies are automatically relegated to the next level, called Felony Arraignment Court.

Each of the 26 judges employed by the municipal court has to complete a 'tour' fairly early in his or her career as judge. The 'tour' consists of two months in Traffic Arraignments, then two months in Misdemeanor Arraignments, and finally another two months in Felony Arraignments. The same single judge handles all the cases in the given arraignment court during the 'tour'. This way, the large bulk of routine cases are delegated exclusively to only a few judges at a time, relieving the rest of the judges to work on more demanding criminal and civil cases.

In the Traffic Arraignment Court, four or five main types of cases are handled: reckless driving, speeding, failures to appear, driving on a suspended or revoked licence, and driving under the influence. DUI cases are the most serious ones handled in that court. Every weekday, the morning session of the court is dedicated to the less serious cases and the afternoon session mainly to DUI cases. It is common that 20 to 40 DUI cases are heard and decided, or else sent forward to trial setting during one afternoon session, lasting roughly two and half hours. The task of the arraignment court is to ensure speedy sentencing, given that the majority of the defendants enter a guilty plea. In other words, this court functions as a filter and buffer, preventing an overflow of cases into full-scale jury trials. Roughly 10 percent of the DUI defendants plead not guilty and are automatically sent to trial setting. But around 90 percent are actually sentenced in the Traffic Arraignment Court.

The Traffic Arraignment Court does not have a jury; the defendants pleading guilty waive their right to a jury trial. In principle, the judge alone makes the decisions. However, the system is dependent on the effective functioning of a plea bargaining machinery. The prosecutors (Deputy City Attorneys) fill out an offer form for each defendant. The large majority of the defendants are counseled by public defenders in cubicles in the hall outside the courtroom. The defendant and the counseling public defender go through the offer and fill out a plea form if the defendant pleads guilty or no contest (the latter meaning guilty but implying that the plea cannot be used in any future civil trial concerning the same incident). They also go through and sign a form acknowledging the advisal of the defendant's constitutional rights. Some, actually very few, defendants hire a private lawyer to represent them. Some, even fewer, choose to represent themselves. The plea bargaining process involves more counseling between the defendant and the public defender than interaction between the public defender and the prosecutor. The latter occurs, too, but only occasionally, when misunderstandings or disagreements surface.

The court is obviously under pressure due to the large caseload. A complex division of labor between the judge, the prosecutors, the public defenders, the clerks, the bailiffs, and the interpreters has been erected to cope with this pressure. In the hearing, the judge relies on a case file containing the prosecutor's complaint and the forms filled out by the defendant and the public defender. In order to prevent the case from being reopened due to technicalities (which would mean additional pressure), the judge must make sure that all the forms are correctly and completely filled out. The judge does not keep and formulate the court minutes; that is the task of the clerk. And the minutes are not a narrative that would need much writing or dictating. Instead, the clerk fills out a rather detailed form, titled Misdemeanor Docket - Judgment/Traffic, in which there is a blank for every possible element of the sentence. Contrary to the Finnish practice, the police report describing the actual incident in a narrative form never enters the hearing. It remains a background document on which the prosecutor based the complaint and the offer. The DUI complaint is a fixed form in which the prosecutor fills in the blanks.

The sentences given to DUI offenders are standardized much as they are in the Finnish court. The legal maximum blood alcohol level is .08 percent in California. For a first offense, the legal sentence is 180 days in jail, but the judge regularly grants probation for five years. The mandatory conditions of probation include a fine of \$390 to \$1000, completion of an alcohol or drug treatment program, and either (a) a minimum of 48 hours in jail or (b) a 90-day driver's licence restriction, allowing driving only to and from work and to and from the court-ordered treatment program. The court may enhance the sentence if the blood alcohol level exceeds .20 percent. The dollar amount paid for the first offense is regularly about \$1000. Hardly anyone chooses the 48 hours in jail because the Department of Motor Vehicles now automatically suspends the offender's driver's licence for four months anyway, regardless of the contents of the court sentence.

The layout of the California courtroom is depicted in Figure 2.2. The first striking feature of Figure 2.2 is the large number of people in the courtroom. It is common that 40 to 50 people are present. And there is an audience, often quite large. The audience, people sitting on the benches in the courtroom, consists of defendants waiting for their turn, and of people accompanying the defendants. The cases may be handled one at a time or in groups of two or more. The judge we observed handled the cases in batches. The clerk called three or four defendants to step to the podium at the same time, and the judge went through these three or four cases as one batch, thus speeding up the procedure.

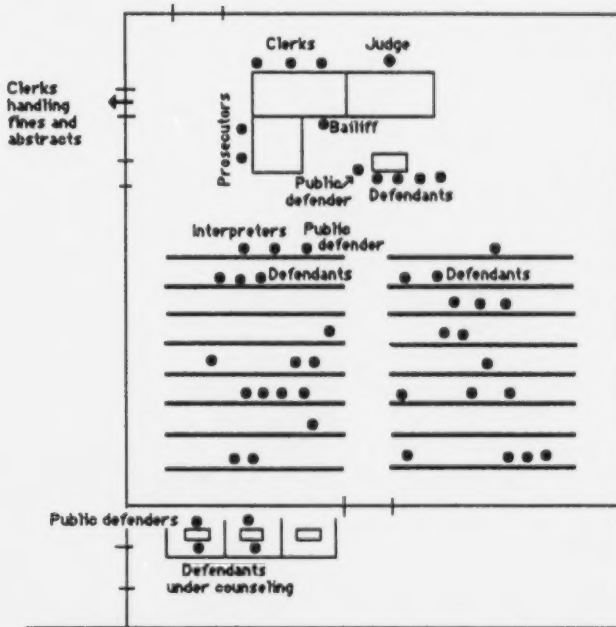


Figure 2.2: The physical layout of the California courtroom

The locus of intensive action is not limited to the courtroom as it is in the Finnish court. In front of the courtroom entrance, public defenders counsel defendants in small cubicles, and this goes on even while the court is in session. And the defendants leave the courtroom usually through the door on the left, entering an adjacent room where clerks receive fines and give out abstracts of court record, little slips containing condensed information on the sentence and a notice of payment of fine (the defendant needs such an abstract in order to get the Department of Motor Vehicles to return his or her driver's licence).

Interestingly enough, the California court highlights its authority more visibly than the Finnish court. As the judge enters the room, the bailiff, wearing a uniform, calls everybody in the room to come to order and stand up. The judge wears a black robe. The judge's bench is very high; others in the room literally have to look up to her (in the case analyzed below, the judge was a woman). The defendants always stand up at the small podium in front of the bench when the judge discusses their cases.

TWO DUI HEARINGS

In the following, I will present the verbatim transcripts of the spoken interactions of two DUI hearings, one from each setting. I have decided to use a minimum of technical notation. A series of dots in the middle or at the end of a sentence indicates that there is a small pause or hesitation in the speech. Necessary explanatory remarks are inserted in the text within brackets []. The letters ADA refer to assistant district attorney in the Finnish court. The letters PD refer to public defender in the California court. One US Dollar is currently worth about 4.20 Finnish Marks, making the Finnish Mark worth roughly one quarter of a Dollar.

I have translated the contents of the Finnish hearing into English myself, knowing full well that it is impossible to provide a translation that would accurately convey all the meanings and nuances across cultures.

Transcript of the Finnish DUI trial

- 001 Judge: Next case number five, the people versus HK. All right, you
002 are HTK. Please take a seat there. R90 dash 125, prosecutor
003 district attorney EK, defendant machinist HTK, complaint
004 driving under the influence of alcohol. New paragraph. You
005 can give me the birth certificate. [Pause] The prosecutor gave
006 the birth certificate and the appendices to the police report
007 one to two. New paragraph. After this the prosecutor read
008 and gave the complaint, appendix three. Go ahead, please.
- 009 ADA: HTK, on the 5th of March 1990 in the city of L, on M Street,
010 drove a passenger car, register plate number ACX-297, after
011 having consumed alcohol so that at the moment of testing his
012 blood alcohol level was at least .058 percent. Therefore I
013 demand that K will be punished for driving under the
014 influence of alcohol, according to the Penal Code paragraph
015 23:1. Additionally I demand that K shall pay restitution to the
016 state for the cost of the blood alcohol test, 262 Marks.
- 017 Judge: You are K, born twenty-five dash ten fifty-two?
018 Mr. HK: Yes.
- 019 Judge: The social security number is 059 and the address is still this
020 30 T Street?
- 021 Mr. HK: Yes.
- 022 Judge: Dependents one child. Is the income 7400 Marks per month
023 still true?
- 024 Mr. HK: Yes.
- 025 Judge: Then you have told the following in the police interrogation:
026 On the fifth of March, 1990, around five o'clock pm I had
027 drunk one bottle of beer in a party. Between eight o'clock and
028 eight forty I was in Bar T where I drank three bottles of beer,

- 029 the last one just before driving away. I had not drunk other
 030 alcoholic beverages during the day. I did not have so called
 031 head start, and I have not used any medication. The
 032 passenger car ACX-297 which is in my permanent possession
 033 was parked in front of Bar T, from where I then drove away
 034 in my car at eight forty. From there I then drove to a nearby
 035 kiosk, about one hundred meters away, in order to go and
 036 buy something to eat. Immediately after arriving in the kiosk
 037 yard I was tested with a breathalyzer by a police officer who
 038 had driven behind me, and at that point I was found to be
 039 under the influence of alcohol. From there I was taken to a
 040 blood test after which I was released. In my own opinion, I
 041 was not drunk when I started driving, and my intention was
 042 to drive home. This is your story. Is it correct?
- 043 Mr. HK: Yes.
- 044 Judge: Then you were taken to this blood alcohol test and the blood
 045 alcohol level at the time of the test has been .058 percent.
 046 And then your driver's licence has been suspended on March
 047 19, 1990. This is correct?
- 048 Mr. HK: Yes.
- 049 Judge: So you confirm the information recorded in this police report?
- 050 Mr. HK: Yes.
- 051 Judge: The defendant K admitted that the information on his vital
 052 statistics is valid and repeated his story which is recorded in
 053 the police report. What do you say about the complaint? Do
 054 you admit it's correct or do you dispute it?
- 055 Mr. HK: The complaint is correct, yes.
- 056 Judge: And he admitted that the complaint is correct. Do you have
 057 anything else to state?
- 058 Mr. HK: Well, only that I'd ask that I'd get the driver's licence back as
 059 soon as possible because I need to drive in my work.
- 060 Judge: What kind of work do you do?
- 061 Mr. HK: Well, my main occupation is machinist, but this is such a
 062 small firm that we must go and do installation and service
 063 work, too.
- 064 Judge: Trips...? [inaudible]
- 065 Mr. HK: Yes, in this city, one necessarily needs a car.
- 066 Judge: And he asked that the suspension of the driver's licence
 067 would be ordered to be as short as possible in duration
 068 because in his work he must visit different locations in the
 069 city and needs a car for this purpose. Do you have anything
 070 else to say?
- 071 Mr. HK: No.
- 072 Judge: Has the prosecutor anything to say?
- 073 ADA: Nothing to add.
- 074 Judge: Well, if you would step into the hall for a moment and wait,

075 so the verdict will be made.
 [Pause; everyone except the judge, the judge intern and the clerk leaves the
 courtroom.]
 076 Judge: You may now take seats. HK is sentenced for driving under
 077 the influence of alcohol to pay twenty daily fines of seventy-
 078 four Marks each, in other words, to pay a fine of 1480 Marks,
 079 and in accordance to the penal code paragraph 23.1, to have
 080 his driver's licence suspended until June 26, 1990. K must
 081 pay restitution to the state for the costs of the alcohol test, 262
 082 Marks. The court considers it proven that on March 5, 1990, K
 083 has driven a passenger car ACX-297 in the city of L on M
 084 Street after having consumed alcohol so that his blood alcohol
 085 level at the time of the test was at least .058 percent. The
 086 proof is the alcohol test and the confession of the defendant.
 087 Therefore the court has sentenced as stated above. A party
 088 dissatisfied with this verdict may appeal to the superior court
 089 of P within 30 days in writing, and this court must be
 090 informed of the dissatisfaction by next Wednesday at the
 091 latest. Here you get these forms for paying the fine and
 092 instructions for appealing if you express your dissatisfaction.

While in the Finnish court the single case of Mr. HK is clearly a unit with a well marked beginning and an end, this is not so in the California court. The cases are handled in batches. In my example, the batch contains four cases. In order to save space, I will include here only the first part of the handling of this batch, the part which contains the entire process for the first of the four defendants, Mr. IJ.

Transcript of the California DUI hearing

001 Bailiff: Following people please approach the microphone. These are
 002 more DUI matters. IJ, RF, GS, CJ.
 003 PD: DH on behalf of Mr. J, Mr. F, Mr. S and Mr. J. They've all
 004 been
 005 advised of their constitutional rights and signed
 006 acknowledgement forms to that effect. They've all been
 007 advised of the charges against them and they waive further
 008 reading, they will each be entering pleas of guilty to vehicle
 009 code, section 23152A. Balance and charges to be dismissed.
 010 Their counsel has advised them of the nature of the charges
 011 against them, possible defenses to those charges and the
 012 consequences of the plea of guilty. Each has initialed, signed
 013 and executed a plea form waiving their constitutional rights
 014 thereon with the exception of their right to counsel, and their
 attorney joins in their plea and waivers, believing them to

015 have been entered knowingly, voluntarily and intelligently.
 016 Judge: Did you have an opportunity to discuss your case with your
 017 counseling attorney, Mr. J?
 018 Mr. U: Yes.
 019 Judge: Mr. F? Am I saying your name right? How do you say your
 020 last name?
 021 Mr. RF: [Utters the correct pronunciation].
 022 Judge: [Repeats the pronunciation]. Okay, and your answer was,
 023 yes?
 024 Mr. RF: Yes.
 025 Judge: Mr. S?
 026 Mr. GS: Yes.
 027 Judge: Mr. CJ?
 028 Mr. CJ: Yes, and I got ah I was readvised to ah change my plea to no
 029 contest.
 030 Judge: Okay. I'll hand the form to counsel and you can make that
 031 change right now.
 032 PD: Is this for Mr. S, your honor?
 033 Judge: Mr. CJ... is changing his to no contest. Do you have any
 034 questions concerning the contents of the plea form or the
 035 entry of your plea, Mr. U?
 036 Mr. U: Pardon?
 037 Judge: Do you have any questions concerning the contents of the
 038 plea form or the entry of your plea?
 039 Mr. U: Ahm ... just how much I'm supposed to pay.
 040 Judge: Okay, that's when we get to the sentence, I'll tell you about
 041 that. Do you have any other questions?
 042 Mr. U: No.
 043 Judge: Okay. Mr. F?
 044 Mr. RF: No.
 045 Judge: Mr. S?
 046 Mr. GS: No.
 047 Judge: Mr. CJ?
 048 Mr. CJ: No.
 049 Judge: Do you understand the mandatory maximum and minimum
 050 penalties for a conviction for this offense and any later
 051 conviction for a same or similar offense, Mr. U?
 052 Mr. U: Yes.
 053 Judge: Mr. F?
 054 Mr. RF: Yes.
 055 Judge: Mr. S?
 056 Mr. GS: Yes.
 057 Judge: Mr. CJ?
 058 Mr. CJ: Yes.
 059 Judge: To the charge that you violated vehicle code section 23152A,
 060 how do you plead, guilty or not guilty, Mr. U?

061 Mr. LJ: Guilty.
 062 Judge: Mr. F?
 063 Mr. RF: Guilty.
 064 Judge: Mr. S?
 065 Mr. GS: Guilty.
 066 Judge: Mr. CJ?
 067 Mr. CJ: No contest.
 068 Judge: Mr. LJ, the complaint alleges that on or about September 24,
 069 1990, you violated vehicle code section 23152A, by driving a
 070 motor vehicle while under the influence of alcohol with a
 071 blood alcohol level of .30; is that what you did?
 072 Mr. LJ: Yes.
 073 Judge: Mr. F, the complaint alleges that on or about July 31, 1990,
 074 you violated vehicle code section 23152A, by driving a motor
 075 vehicle while under the influence of alcohol with a blood
 076 alcohol level of .17; is that what you did?
 077 Mr. RF: Yes.
 078 Judge: Mr. S, the complaint alleges that on or about September 23,
 079 1990, you violated vehicle code section 23152A, by driving a
 080 motor vehicle while under the influence of alcohol with a
 081 blood alcohol level of .19, is that what you did?
 082 Mr. GS: Yes.
 083 Judge: Mr. CJ, the complaint alleges that on or about September 8,
 084 1990, you violated vehicle code section 23152A, by driving a
 085 motor vehicle while under the influence of alcohol with a
 086 blood alcohol level of .19, are those the facts you're not
 087 contesting?
 088 Mr. CJ: Yes, your honor.
 089 Judge: The court accepts your pleas, makes the findings in order as
 090 set out on the plea form directly above the court signature.
 091 The people's motion to dismiss the balance of each complaint is
 092 granted. Mr. LJ, I sentence you to one hundred eighty
 093 days in the custody of the sheriff. Execution of sentence
 094 suspended for five years on the following terms and
 095 conditions of probation: that you violate no laws, that you
 096 obey the standard alcohol conditions, that you attend the first
 097 conviction program, that you pay a fine of nine hundred
 098 thirty nine dollars plus fifty one dollars to the crime victims
 099 fund, that your driver's license be restricted for ninety days,
 100 that you do twenty days of volunteer work. Do you accept
 101 probation on those terms and conditions?
 102 Mr. LJ: Yes.
 103 Judge: All right, that will be the order. For what organization do you
 104 want to do the volunteer work?
 105 Mr. LJ: Ahm. . . Little League Park.
 106 Judge: Little League?

- 107 Mr. U: Yeah, ... Park.
 108 Judge: Little League Park.
 109 PD: [Inaudible; requests a sidebar conference with the judge.]
 110 Judge: All right. If you really think it's necessary. [Goes to the side to confer with the PD and the prosecutor.]
 111 PD 2: Your honor.
 112 Judge: Yes?
 113 PD 2: May I inquire? [Calls five defendants to counseling.] GM, AF, EH, EJ, LH.
 114 Judge: [Returns to the bench.] Okay, Mr. U, that sounds like a fine plan for volunteer work. Ahm, do you need time to pay the fine?
 118 Mr. U: Yes.
 119 Judge: How much time do you need?
 120 Mr. U: Ahm... what's the maximum?
 121 Judge: Ahm... well are you employed?
 122 Mr. U: No ...on SSI [Social Security Insurance/Disability].
 123 Judge: Okay, how about one year?
 124 Mr. U: Yes.
 125 Judge: Okay? Try to make...
 126 Mr. U: I can do it before.
 127 Judge: Do the best you can but in... in no event longer than one year, okay?
 129 Mr. U: Okay.
 130 Judge: But you might want to try to make periodic payments, although I'm not going to make that a requirement, okay?
 132 Mr. U: Okay.
 133 Judge: All right, and I asked, did I ask? Do you accept probation on all these terms and conditions that we just talked about?
 135 Mr. U: Yes. Okay, on probation?
 136 Judge: You're going to be on probation for five years.
 137 Mr. U: With a pro... probation officer?
 138 Judge: No, not with a probation officer.
 139 Mr. U: Okay.
 140 Judge: What that means is, if you get another violation for driving under the influence in the five years, your probation can be revoked and you can be ordered to serve the custody.
 143 Mr. U: ... hmm.
 144 Judge: So for that whole five year period you want to do all of the things that you are supposed to do, okay?
 146 Mr. U: Yeah.
 147 Judge: All right, that will be the order. Good luck.
 148 Mr. U: Hmm.
 149 Judge: Mr. F, I sentence you to one hundred eighty days in the custody of the sheriff. Execution of sentence suspended for five years on the following terms and conditions of probation:

- 152 that you violate no laws, that you obey the standard alcohol
 153 conditions, that you attend the first conviction program, that
 154 you pay a fine of nine hundred thirty nine dollars plus fifty
 155 one dollars to the crime victims fund. That your license be
 156 restricted for ninety days, that you perform five days of
 157 public work service. Do you accept probation on those terms
 158 and conditions?
 159 Mr. RF: Yes.
 160 Judge: All right, that will be the order. Ah... do you need time to pay
 161 the fine?
 162 Mr. RF: Yes, I need six months.
 163 Judge: All right, that will be the order.
 164 Clerk: Ah... six months, your honor?
 165 Judge: Yes, six months to pay the fine. On the last case, ...ah ...Mr.
 166 U, I didn't say how long he should have to do his volunteer
 167 work. Let's make it six months.
 168 Clerk: Okay.

As I pointed out above, this excerpt is not an intact unit in the judge's work. Even the batch of cases is not such a unit with clear boundaries - there is no pause between the batches and fragments of upcoming batches appear in the middle of ongoing batches (see lines 111 to 114 above). It seems that the unit for the judge is an entire session. This was confirmed by the judge in her interview.

Judge: In fact, I think I probably take it by the session, morning and afternoon.

Interviewer: So that's the unit of your work?

Judge: Yes, every session is a new beginning and an end.

THE MULTIPLE DIALECTS OF THE JUDGES

Perhaps the most striking feature about the Finnish hearing is the extent to which the compilation and dictation of the minutes dominates the interaction. In his interview, the judge himself pointed this out at the outset.

Judge: Everything is focused on the minutes. The most important thing is that the minutes are right, more important than anything else, because nobody pays attention to anything else except to the correctness of the minutes.
 (...) So the technical aspect takes most of the time.

There are large segments in the transcript in which the judge is addressing his speech primarily to the emerging minutes (via the taperecorder), not to any of the people present in the courtroom. I call this *the dialect of document making*. The judge quite abruptly switches from this dialect to the more familiar *dialect*

of adjudication, and back again. The very beginning of the transcript provides good examples of such switches.

001 Judge: Next case number five, the people versus HK. All right, you
 002 are HTK. Please take a seat there. *R90 dash 125, prosecutor*
 003 *district attorney EK, defendant machinist HTK, complaint*
 004 *driving under the influence of alcohol. New paragraph. You*
 005 *can give me the birth certificate. (Pause) The prosecutor gave*
 006 *the birth certificate and the appendices to the police report*
 007 *one to two. New paragraph. After this the prosecutor read*
 008 *and gave the complaint, appendix three. Go ahead, please.*

Here the judge first talks to the defendant in the regular dialect of adjudication. He then switches over to the dialect of document making - here printed in italics. He then says to the prosecutor "You can give me the birth certificate" in the regular dialect of adjudication, to return again to the dialect of document making, and to finish again in the dialect of adjudication ("Go ahead, please").

There is one passage in the transcript where the judge talks in a way that doesn't fit either one of the two dialects identified above. From line 058 to line 065, the judge and the defendant discuss the latter's request to get his driver's licence back as soon as possible because he needs it in his work. The judge asks "What kind of work do you do?" (line 060) and subsequently another question about the trips involved in the work (line 064). These questions go beyond the restricted legal script of a standard DUI hearing in that they are not questions to which the police report would already contain answers, only to be confirmed by the defendant. In fact, the first question is nicely paradoxical: the police report tells that the defendant's occupation is machinist, machinists do not by definition need to drive in their work, yet the defendant says he needs to drive in his work - hence, *what kind of work does he really do?* I call this *the dialect of socio-economic adjustment*. It is the dialect of finding out about the defendant's lifeworld and adjusting the sentence accordingly.

The dialect of adjudication is essentially that of proceeding toward the sentence according to the standard legal script. The dialect of document making is that of preparing a document that will fulfill the standard requirements of clear and complete court minutes. These two dialects are different in that the dialect of adjudication follows above all the logic of substantively correct legal procedure, while the dialect of document making follows the logic of appropriate documentation regardless of the contents to be documented. Thus even when the dialect of adjudication is temporarily abandoned as in the passage concerning the defendant's work, that exceptional piece of conversation is faithfully reproduced in the dialect of document making, as happens on lines 066 to 069.

It is interesting to note that the Finnish court procedure routinely offers to the judge a fair amount of information pertaining to the defendant's socio-economic situation: occupation, income, and number of dependants. All these are data that the California judge does not encounter in the hearing. Similarly, the Finnish fine is based on the income of the defendant while the California fine is fixed and the same regardless of the economic means of the defendant.

The California Judge speaks in the dialect of adjudication, in this case obviously not selecting between the arguments of adversaries but simply proceeding according to the script toward the standard sentence. On lines 103 to 132 of the transcript, she also speaks richly in the dialect of socio-economic adjustment. Her use of this dialect is not limited to questions about the defendant's living conditions; she actually engages in a negotiation of a workable plan for carrying out the volunteer work and paying the fine.

However, she also uses dialects that are missing in the Finnish hearing. These include *the dialect of prevention*, *the dialect of monitoring*, and *the dialect of instruction*.

The dialect of prevention is very closely related to the dialect of socio-economic adjustment - these two are practically flip sides of the same coin. When the judge gives the defendant a year to pay the fine (lines 123 to 132), she not only wants to take the defendant's life situation into consideration. She is also attending to the 'business' of the court system in processing the caseload.

Judge: What we can't afford to do is keep seeing these people over and over and over again. So, the reason I say how much time do you need to pay is that I am very, very liberal in the amount of time I'll give them to pay. I am real hard on the people who come back and have had a long time and still haven't paid.

And further:

Judge: It is too hard on the system to have them keep coming back. (...) My philosophy is how can I help the defendant to become law-abiding, how can I make being law-abiding accessible. Because if it's not accessible, then they are going to be non-law-abiding, they are going to break the law. I want everybody, as soon as possible, to have driver's licence and to have insurance, to have registration.

In other words, the judge wants to prevent the sentence from becoming a cause for new offenses and new visits to the court - which would further increase the pressure on the court. Failures to pay the fine within the given period of time lead to new hearings and thus to an increased caseload. Thus the judge wants to make sure that the defendant expresses a clear and unambiguous commitment

to fulfilling the terms of probation. In the hearings, this dialect becomes dominant typically when the judge emphasizes an exact date by which the fine must have been paid. In the case analyzed here, this dialect surfaces briefly on lines 127 to 128: "in no event longer than one year, okay?"

Admittedly this is not a strong example of the dialect of prevention. In other hearings conducted by the same judge, there are clearer examples. The judge is as if alerted and changes her dialect noticeably whenever there is ambiguity concerning the date by which the fine must be paid. The following example is a case in point.

Judge: You are going to have to give a higher priority to this matter. I appreciate that you have a limited amount of income and that you want to pay your bills, but this is probably your only creditor who can put you in jail and revoke your probation. I am willing to work with you and give you more time, but you haven't done anything and you're still not offering me anything except a vague statement that maybe in December you'll have some money. I, I need concrete facts, "on this date I will pay X number of dollars and I need this much more time to pay the balance", then I'll work with you but not with vagaries.

Defendant: I... I can pay it on the first of December.

This excerpt is interesting in that the judge's dialect of prevention actually acquires a flavor of the dialect of instruction when she didactically tells the defendant how to be concrete. It may also be pointed out that the judge talks about 'working with' the defendant, a phrase highly unlikely to be used by the Finnish judge.

The dialect of monitoring is a 'metacognitive' dialect of supervising, coordinating and planning, as well as checking and pointing out errors or omissions in the forms produced and actions performed by the public defenders, prosecutors, clerks, and interpreters - as well as by the judge herself. In the case selected for the present analysis, there are two minor examples where the judge uses the dialect of monitoring her own actions. On line 133, she asks: "All right, and I asked, did I ask?" And later, on lines 165 to 166, she says: "...ah ...Mr. U, I didn't say how long he should have (...)"

The use of the dialect of monitoring others is, however, much more common throughout the hearings. These situations often involve collaborative checking and troubleshooting. On lines 28 to 33 of the transcript, we see one such example, involving an exchange between the judge, the defendant, and the public defender. Here is a further example from another hearing on the same afternoon:

Judge: All right, that will be the order. I don't have an advisal slip of constitutional rights from Mr. H, so I'll need that before he goes into the clerk's office.

PD: Ah ... don't we also need a victims', for the victims' names...?

Judge: All right, and we need a victims list. Okay. Same counsel will take care of the matter of the victims' names. You may go into the clerk's office.

Here the judge's initial monitoring about the missing advisal slip leads the public defender to notice the missing victims list. In the interview, the judge comments on such events.

Judge: The public defenders are overworked, trying to counsel every single person who comes in every morning. So they, being human beings and being overworked, they tend to make a lot of mistakes on the plea forms that they fill out. The prosecutor seems to make fewer errors. But it is the same thing, they are overworked, too, and so, as I am the one with the responsibility, I guess I'm the one who has to make sure that it all falls together.

And later she explains why the monitoring tends to happen in a collaborative manner.

Judge: Normally a judge wouldn't do that. Normally the judge would just reject the paperwork, say go away and fix it and come back. But we can't do that here, because we don't have time. And also it's not the defendant's fault, it's the fault of the attorney. So my philosophy is I just try to fix it.

The dialect of instruction is evident in the transcript on lines 140 to 146. The defendant asks a question that indicates to the judge that he has not quite understood what the sentence implies. She then rather didactically explains the legal contents of the sentence. This may be a dialect that is partially replaced in the Finnish court by the meticulous practice of document making. Listening to the judge dictating the minutes may have an unintended didactic function. And the availability of detailed minutes may in many cases help the client understand what actually was the content of the sentence and on what grounds was it decided.

Table 2.1 sums up the multiple dialects the judges were found to use in these two court hearings.

Table 2.1
Dialects employed by the Finnish judge and the California judge

<u>The Finnish judge</u>	<u>The California judge</u>
The dialect of adjudication	The dialect of adjudication
The dialect of document making	The dialect of instruction
The dialect of socio-economic adjustment	The dialect of socio-economic adjustment
	The dialect of prevention
	The dialect of monitoring

These findings open up interesting questions about the impact of rationalization on expertise. Traditionally rationalization has been seen as process of deskilling, reducing expertise to standardized routines. In the California court, such effects are visible.

Judge: Oh, and the other thing that I am ashamed to say on a tape recording, that my brain is in suspended animation practically. It doesn't even do things it used to do. So that I see so many people that they can go into the bail office, they come back five minutes later and I do not remember them. Or, if I remember them, I don't remember what they are there for.

But these effects don't seem to be the most important and interesting ones. The really interesting feature is the emergence of new dialects, of new 'mental registers' that the judge must employ in order to cope with the complexity. These new dialects don't seem to have much to do with the traditional prestigious core of judicial expertise and legal thinking. They are mundane dimensions of daily routine. And yet they seem to be key cognitive components of what Seron (1990, p. 461-462) calls "a more activist judicial posture toward management of cases", associated with the ongoing "systemic push" in courts.

THE STANDARD ACTIONS OF THE JUDGES

Both judges handle the DUI case in the courtroom by proceeding through certain standard actions. By standard actions I mean procedural steps that follow the legal script of a minimal, disturbance-free case. The script and sequence of these actions is, however, significantly different in the two cultural settings.

In the Finnish court, the standard actions proceed as follows:

1. Presenting the case (lines 001 to 016)
2. Matching the defendant with the file (lines 017 to 057 and 069 to 073)
3. Deliberating the verdict (lines 074 to 075)
4. Sentencing (lines 076 to 092)

In a graphic form, the logic of these actions is depicted in Figure 2.3.

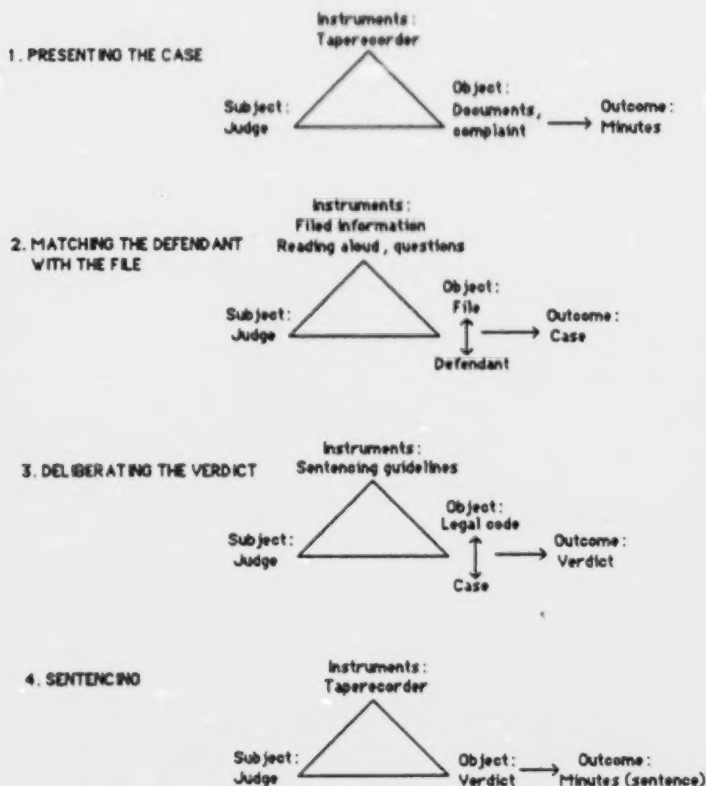


Figure 2.3: The script of standard actions in the judging of the Finnish DUI case

The first action of presenting the case is actually aimed at producing the first section of the minutes, consisting of the birth certificate of the defendant, the police report, and the complaint. The second action of matching the defendant with the file is aimed at producing a sentencable case, i.e., one in which the documents and the defendant in flesh-and-blood merge together through the latter's confirmation of the validity of the documents.

The third action of deliberating the verdict is a rather empty anachronism in this type of cases where the verdict is reached through a simple, highly schematized matching between the penal code and the case. The unofficial sentencing guidelines adopted by the court function here as a pretty clearcut instrument (in more complex cases, legal precedents are typical instruments). Finally the fourth action of sentencing is again aimed at producing the minutes, this time the sentence part.

In the California court, the sequence of standard actions looks like this:

1. Matching the defendant with the file (lines 003 to 018, 049 to 052, 059 to 061, and 068 to 072)
2. Sentencing, or matching the case with the legal code (lines 092 to 102)
3. Adjusting, or matching the sentence with the defendant's life situation (lines 103 to 104 and 116 to 117)

This sequence can again be depicted with the help of graphic models (Figure 2.4). Here, too, the sentencing is highly constrained by its instruments. On the other hand, deliberation is eliminated as a separate action. The big difference in comparison to the Finnish case is the third standard action, adjusting. The script used in the California court required that each defendant was asked about the time needed for the payment of the fine, and many defendants were also asked about the organization where they wanted to serve their volunteer work service. Volunteer work was used in the cases when the defendant was not considered able to do more strictly supervised and physically demanding public work service. Even in the cases involving public work service, the defendant and judge often discussed issues like where and within what time period the work service had to be completed.

In Finnish courts, public work service and voluntary work have thus far not been legal options, and the defendant's ability to pay has been assumed on the basis of the reported income. Thus, no action of adjusting has been included in the standard script for handling DUI cases.

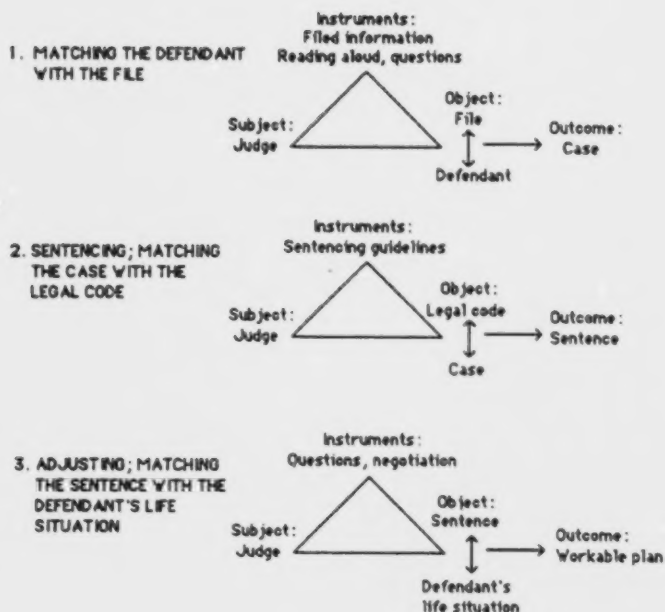


Figure 2.4: The script of standard actions in the judging of the California DUI case

Now that we know something about the multiplicity of the dialects used by the judges and about the sequence of their standard actions, we may ask: What in the actions sequences prompts the judges to change their dialects? What makes them expand and step into registers that are outside their traditional roles?

DISTURBANCES, REPAIR ACTIONS AND LEARNING IN THE HANDLING OF DUI CASES

In the Finnish DUI hearing, only one phase stands out as a deviation from the script. It happens at the end of the second standard action, matching the defendant with the file.

- 056 Judge: And he admitted that the complaint is correct. Do you have
 057 anything else to state?
 058 Mr. HK: Well, only that I'd ask that I'd get the driver's licence back as
 059 soon as possible because I need to drive in my work.

- 060 Judge: What kind of work do you do?
 061 Mr. HK: Well, my main occupation is machinist, but this is such a
 062 small firm that we must go and do installation and service
 063 work, too.
 064 Judge: Trips...? [inaudible]
 065 Mr. HK: Yes, in this city, one necessarily needs a car.
 066 Judge: And he asked that the suspension of the driver's licence
 067 would be ordered to be as short as possible in duration
 068 because in his work he must visit different locations in the
 069 city and needs a car for this purpose. Do you have anything
 070 else to say?
 071 Mr. HK: No.

Although in practice it has become quite common that DUI defendants express wishes regarding the length of the suspension of their driver's licences, the standard script would assume that to the judge's routine question on lines 057 and 058, the answer would be 'No'. Thus, the defendant's question is a mild disturbance. The judge's repair action is that of assuming temporarily the dialect of socio-economic adjustment (lines 060 and 064), only to return to the script through the gateway of the detached dialect of document making (lines 066 to 069). The question 'Do you have anything else to say?' (on lines 069 to 070) is in effect a repetition of the question that started the disturbance (on lines 056 to 057) and it signals the closing of that episode and a return to normalcy.

This disturbance did not lead to a substantive reconceptualization of the object of the judge's work. In other words, it was resolved in regressive manner. When viewing the videotaped hearing, the judge commented on the defendant's request as follows.

Judge: Well, one doesn't always have to take it... what the defendant says, whether it's true or not. I mean, he can just as well say that yes, he needs the licence. (...) Sometimes they even have some papers and certificates, that they need it. So that is relatively... But it's always considered, because the law requires, if it's because of the occupation. And here the suspension of the licence would have been longer if it had not been taken into consideration a little bit, so it would have been. Our minimum has been four [months], and here if I recall he got probably only three, about three months. Since a part of that time had already passed, he'll get it back already at the end of May, so it won't be long anymore.

Actually the judge remembers the date wrong. The defendant will get his licence back only at the end of June, not at the end of May. The judge thought that he took the defendant's request into consideration and it had some effect on the length of the suspension. The defendant, however, thought otherwise.

Mr. HK: I need it, I need my driver's licence. I must... I've driven a car for 19 years, so it... it goes like that. You don't even remember that you don't have it. Since it doesn't affect your driving performance in any way, whether you have the licence or not. I don't understand why the judge cannot give it back. I don't know what the minimum penalty is - is it three? Or not necessarily anything.

Interviewer: What do you think, was your request taken into consideration?

Mr. HK: Not at all, in my opinion. (...)

Interviewer: Do you have an opinion about what would be a just sentence here, or a decision you'd be satisfied with?

Mr. HK: Well, I've been without my licence for two months, and now I've got about 1500 to 1600 Marks fines to pay. I think it's a pretty hard sentence for such a small excess [in the blood alcohol level].

Interviewer: You mean that would be a sufficient sentence?

Mr. HK: Yes, I think that two months without the licence and 1500 Marks fine, it's pretty appropriate.

Interestingly enough, the defendant quite clearly hints at the possibility that being without the licence leads him to break the law again by driving without a licence. Later the interviewer asks whether the defendant thinks that the judge understood what defendant's request was.

Mr. HK: Yes, I think it should have become quite clear to him. I mean, I could not tell the judge that I'm forced to driving without the licence. If I had said that, he would have given me more

This aspect is not considered by the judge in his interview answers. The judge was asked about his view of the meaning of the sentence to the defendant.

Judge: You mean the meaning of the sentence for me or for him? For me it does not...

Interviewer: No, I mean for the defendant.

Judge: No, they usually know it. Usually they anticipate what they'll get.

There is no trace here of the dialect of prevention. In fact there is a wide gap between the defendant's notion of an appropriate sentence and the judge's basic conception of DUI cases.

Judge: I think driving under the influence is a bad crime. I mean even a case like this. (...) So driving under the influence, when you ask for my personal opinion, it is a terrible crime.

The judge actually states that the defendant "seemed to be quite satisfied, no problem." But he quickly adds:

Judge: It [the sentence] is given, and then it won't be changed anymore. (...) I say in court that this case is so and that's it. [Jokingly:] That's the way it is at home, too. No negotiation, it's like this.

What is regressive about the resolution of the disturbance is not that the judge and the defendant disagree. The regressiveness stems from the fact that there is no shared elaboration of the sentence in relation to the defendant's life situation. If the judge elaborates on the defendant's request, he does it alone during the deliberation, not interactively. This allows for no mutual reinterpretation of the situation and, correspondingly, calls for no explicit commitment from the defendant. The judge regards a DUI case like this a strictly scripted, unalterable unit.

Interviewer: How did the decision making happen in this case?

Judge: There is not much to it. It is almost like a rubber stamp case.

Interviewer: So the only thing was that request of his?

Judge: Well, even that wasn't anything as such. These DUI decisions one could almost give like with a rubber stamp. There was no real deliberation.

Interviewer: Are these necessary hearings, then?

Judge: Well, one must sentence them. There is no other instance to do it.

This attitude may also have something to do with routinization through extensive experience. The Finnish judge has worked for 16 years as municipal court judge.

In the California hearing, there are altogether six disturbances and associated repair actions. The first two take place in connection to the first standard action, matching the defendant with the file. Interestingly enough, they are launched by almost the very same question that launched the only disturbance in the Finnish case.

033 Judge: Mr. CJ... is changing his to no contest. Do you have any

034 questions concerning the contents of the plea form or the

035 entry of your plea, Mr. JJ?

036 Mr. JJ: Pardon?

037 Judge: Do you have any questions concerning the contents of the

038 plea form or the entry of your plea?

039 Mr. JJ: Ahm ... just how much I'm supposed to pay.

040 Judge: Okay, that's when we get to the sentence, I'll tell you about

041 that. Do you have any other questions?

042 Mr. JJ: No.

Here the first disturbance is utterly simple: on line 036, instead of answering 'No' like a script-abiding defendant should, Mr. JJ answers 'Pardon?', indicating that he has either not understood or not heard the question. The judge's repair action is equally simple: she repeats the question (lines 037 to

038). However, that immediately launches another disturbance: instead of answering 'No', the defendant asks how much he's supposed to pay. The judge's repair action uses the dialect of instruction: 'Okay, that's when we get to the sentence, I'll tell you about that' (lines 040 to 041). Here, the relatively novel dialect of instruction is evoked by the disturbance. It should be noted that at this point, the judge doesn't realize that there is anything exceptional about the defendant, Mr. *IJ* (see below).

The next disturbance occurs in connection to the the third standard action, adjusting, or matching the sentence with the defendant's life situation.

- 103 Judge: All right, that will be the order. For what organization do you
 104 want to do the volunteer work?
 105 Mr. *IJ*: Ahm. . . Little League Park.
 106 Judge: Little League?
 107 Mr. *IJ*: Yeah, ... Park.
 108 Judge: Little League Park.
 109 PD: [Inaudible; requests a sidebar conference with the judge.]
 110 Judge: All right. If you really think it's necessary. [Goes to the
 side to confer with the PD and the prosecutor.]
 111 PD 2: Your honor.
 112 Judge: Yes?
 113 PD 2: May I inquire? [Calls five defendants to
 114 counseling.] GM, AF, EH, EJ, LH.
 115 Judge: [Returns to the bench.] Okay, Mr. *IJ*, that sounds like a fine
 116 plan for volunteer work. Ahm, do you need time to pay the
 117 fine?

Here, instead of giving a name of an acceptable organization, the defendant names the Little League Park as his volunteer work site (line 105). The judge is baffled. Then the public defender steps in and asks for a sidebar conference with the judge. In other words, the first repair action is collaborative. The judge grants (line 110) and holds the sidebar conference which is joined by the prosecutor, too. In the interview, I asked the judge about this episode.

Judge: His mother was with him and he was very limited in what he could do.

Interviewer: I suppose he was mildly retarded, or...?

Judge: Right, so I decided to let him do whatever he wanted to do.

Interviewer: I just wondered why the public defender did not inform you clearly about the nature of the case and that he actually had to have a sidebar.

Judge: I know. I don't know.

Interviewer: As soon as the man started walking, you could see that he was somehow handicapped. But when he was standing there, there was no way you could see?

Judge: No, I didn't. I didn't know. That's why I thought 'Little League', for crying out loud!

As the judge returns to the bench, she further repairs the disturbance by using the dialect of socio-economic adjustment in a very determined manner: 'that sounds like a fine plan for volunteer work' (lines 115 to 116). Another related disturbance follows immediately as the defendant, instead of requesting a certain amount of time for payment asks 'what's the maximum?'. Now the judge systematically works in the dialect of socio-economic adjustment, negotiating a very flexible plan for the defendant (lines 121 to 132).

The next disturbance is curiously connected to the second standard action, sentencing or matching the case with the legal code.

- 133 Judge: All right, and I asked, did I ask? Do you accept probation on
 134 all these terms and conditions that we just talked about?
 135 Mr. U: Yes. Okay, on probation?
 136 Judge: You're going to be on probation for five years.
 137 Mr. U: With a pro... probation officer?
 138 Judge: No, not with a probation officer.
 139 Mr. U: Okay.
 140 Judge: What that means is, if you get another violation for driving
 141 under the influence in the five years your probation can be
 142 revoked and you can be ordered to serve the custody.
 143 Mr. U: ... hmm.
 144 Judge: So for that whole five year period you want to do all of the
 145 things that you are supposed to do, okay?
 146 Mr. U: Yeah.
 147 Judge: All right, that will be the order. Good luck.
 148 Mr. U: Hmm.

This time, it is not the defendant but the judge herself who initiates the disturbance. She has already once asked the defendant whether he accepts the probation on the given conditions (lines 100 to 101) and she has received the scripted 'Yes' answer (line 102). But the complexity of the situation makes her forget that, and she asks the question again. Now the defendant expresses uncertainty about understanding the sentence (lines 135 and 137) and the judge repairs the disturbance by using the dialect of instruction. Although her closing comment on line 147 ('All right, that will be the order. Good luck.') is exactly according to the script, the presence of disturbance is not totally ruled out, as may be seen in the defendant's reaction: 'Hmm' (line 148).

The last disturbance is also self-initiated by the judge. It is related to the third standard action, adjusting, or matching the sentence with the defendant's life situation.

- 165 Judge: Yes, six months to pay the fine. On the last case, ...ah ...Mr.
 166 JJ, I didn't say how long he should have to do his volunteer
 167 work. Let's make it six months.
 168 Clerk: Okay.

Here Mr. JJ has already left the courtroom. But in the middle of the next case, the judge suddenly remembers that she failed to agree with Mr. JJ on the amount of time given to complete the volunteer work. She quickly repairs that using what I interpret to be the dialect of socio-economic adjustment. Since that dialect is inherently dialogic and the dialogue partner is no longer present, the judge uses the clerk as a substitute partner: 'Let's make it six months'. And the clerk responds: 'Okay'.

In order to obtain a more representative picture of the disturbances and repair actions, I analyzed the transcripts of all the DUI cases with guilty or no contest pleas handled during the afternoon session that included also the case of Mr. JJ. There were 21 DUI cases during that afternoon. In fourteen cases, a plea of guilty or no contest was submitted. In those fourteen cases, I identified 32 disturbances. This means an average of 2.3 disturbances per case. The disturbances were connected to the three standard actions as shown in table 2.2.

Table 2.2

The distribution of disturbances in DUI hearings during one session in the California court

<u>Standard action</u>	<u>Number of disturbances</u>
1. Matching	13
2. Sentencing	13
3. Adjusting	6

In the corresponding repair actions, 35 distinct uses of dialects were identified (in three repair actions, the judge used two dialects). The distribution of those dialects is shown in Table 2.3.

Table 2.3

The distribution of dialects used by the California judge in repairing disturbances

Standard action	Dialect used in repair action				
	Adjudication	Instruction	Adjustment	Prevention	Monitoring
1. Matching	1	3	-	-	9
2. Sentencing	-	2	-	-	12
3. Adjusting	-	-	4	2	2

Table 2.3 shows that the standard actions of matching and sentencing elicited mainly disturbances that led to repair by monitoring, and to a lesser degree to repair by instruction. The standard actions of adjusting elicited disturbances that led to repair by socio-economic adjustment, prevention and monitoring. In other words, the action of adjusting the sentence to the life situation of the defendant has qualitatively different implications from the other two standard actions. This poses an interesting question to the Finnish court which has no such action of adjusting in its standard script.

Furthermore, Table 2.3 shows that the dialect of monitoring is quite dominant in the repair actions of the California judge. This reflects the fact that there is an amazing amount of small troubles with the paperwork and also with translations both in matching the defendant with the file and in formulating the sentence. These disturbances commonly require active involvement and collaboration of two or more persons in the courtroom.

From the examples analyzed above, it seems clear that disturbances tend to push the judges into taking up novel, non-scripted dialects such as the dialect of socio-economic adjustment, the dialect of instruction, and the dialect of monitoring. Such moves to adopt novel dialects are crucial forms of learning. Such learning is not simply learning by 'tuning' and perfecting the standard performance (see Norman, 1982). The adoption of novel dialects seems to require stepping out of the ordinary routine, into the realm of experimentation and construction.

These expansive moves are certainly partly spontaneous situational responses to unexpected contingencies. However, there are indications that such moves may also become conscious innovative strategies. In the California court, the

dialect of socio-economic adjustment seems to be part of the routine script. But in her interview, the judge clarified the issue as follows.

Judge: Not all judges do that. For example somebody else was here yesterday [as a substitute; Y.E.] and the clerks told me that that judge said that I don't want to talk to anybody about converting any fines into public work service, I don't want to talk to anybody about time to pay, and he also ordered the clerks not to have any pauses between the cases. (...) But the reason I do that, I have a lot of reasons why I do that. One of them is that a lot of the cases on my calendar are people who were sentenced before by another judge. Since I've only been here 30 days and, well, not even 30 days, and I'm only going to be here 30 days more, I see, I don't know, ten or twenty people a day who are sentenced by other judges, probably more than that, and haven't done what they said they were going to do. I sincerely believe that if the last judge had worked with them a little bit more when they were being sentenced, they might have been more realistic at the outset and they wouldn't be back seeing me again. (...) I would rather they took a really long time to pay than that they came back to the court over and over and over again. So I'll give anybody six months to pay a driving under the influence fine, which is about \$1000. The guidelines before I got here from the last judge were four months. I don't think four months is enough time. I would have a hard time paying a fine of \$1000 in four months and I think that I'm probably better situated than a lot of these people.

The judge's answer indicates that the standard action of adjusting could quite well be performed by using the dialect of regular adjudication - that is, by simply stating how much time the defendant is granted for paying the fine ("I don't want to talk to anybody about time to pay") and where he or she must perform the voluntary work. Here the judge is consciously stepping out of such previously established and commonly used script, to construct a novel script for her own work. This expansive move cannot be attributed to a lot of direct experience. To the contrary, the judge has worked in this setting for less than a month, and as municipal court judge only a year. One is tempted to hypothesize that the very lack of routine is here a precondition for innovative learning.

CONTRADICTIONS BEHIND DISTURBANCES

What causes the disturbances to appear in the first place? First of all, our observations indicate that the disturbances described above are not just accidental and arbitrary. They seem to be systemic. Perrow (1984) has written about 'normal accidents', failures and breakdowns that are caused by the complexity of the system itself. His material is drawn from large-scale technological systems where disturbances often reach a spectacular scale.

Courts are not very large organizations and they rely on low level technology, yet their social organization is complex. Consequently, their disturbances are typically local rather than global and commonplace rather than spectacular. But they are no less systemic and 'normal'.

To understand how systemic disturbances arise, one needs conceptual tools to analyze the activity system of the court. I will here employ an extended version of the triangular model I have already used above in Figures 2.3 and 2.4 (for theoretical background of the model, see Engeström, 1987; for prior examples of application, see Engeström, 1990). I will take one more close look at two key disturbances in the examples used above: the defendant's request for short suspension of his driver's licence in the Finnish hearing (lines 056 to 071), and the defendant's suggestion of Little League Park as the organization of his volunteer work in the California hearing (lines 103 to 117). In interpreting the causative background of these disturbances, I will hypothetically identify certain contradictions in the activity systems of the respective courts.

In both cases the disturbance is launched by the defendant's request. In other words, its point of initiation is the *object* of the judge's work. The defendant's request goes beyond the information recorded in the file and thus creates a mismatch. In the Finnish court, that mismatch is only heard and recorded in the minutes. The judge repairs it regressively, by using the dialect of document making. But the mismatch is not elaborated interactively because the rules of the scripted procedure exclude such interactive elaboration. This is a systemic contradiction between a fundamentally *unpredictable object* and *inflexible procedural rules*. This contradiction is schematically depicted in Figure 2.5 (which is an extension of the second action in Figure 2.3). Tensions between the components of the activity system are indicated with the help of two-headed lightning arrows.

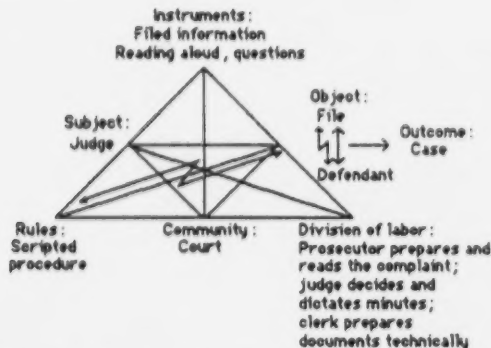


Figure 2.5: The contradiction behind the disturbance in the Finnish court

In the California court, the defendant's initial request is elaborated interactively. But the elaboration is first blocked by missing information. The judge does not know why the defendant presents such an unusual request ('Little League Park').

The documents in front of the judge do not give her the needed information. The documents are highly standardized forms in which almost all information is in the form of filled blanks. Additional freely formulated information is practically excluded. In other words, there is a systemic contradiction between a fundamentally *unpredictable object* and *inflexible instruments*.

In her interview, the judge touched upon this contradiction when asked what would be the first thing she would like to have changed in the court's operation.

Judge: We need to automate. If we were automated, I think it would make all the difference in the world. (...) I know that some things are automated but this is something that just cries out for it because of the volume. If we were automated, I would assume that the judge would have a computer on the bench and that when a defendant appeared, would be able to plug it in and everything would be there and wouldn't need all of this paper. If that happened, then the clerk wouldn't have to spend two to three hours pulling all the files every morning and I wouldn't have to spend all the time I do thumbing through this trying this trying to figure out why the people are there, and neither would the prosecutor and neither would the public defender.

Computerization may not solve the problems quite the way the judge hopes. Our previous research in the use of computerized medical records (Engeström, Engeström & Saarelma, 1988) indicates that while computerization of manual forms may make the workflow more speedy and efficient, it often at the same time aggravates and makes more visible the problems produced by a compartmentalized division of labor in the activity system.

In the case of Mr. JJ, the forms have been filled by the prosecutor, the public defender (together with the defendant), and the clerk. The disturbance launched by the 'Little League Park' request was a product of a division of labor in which these members of the activity system were somehow working as if in their separate compartments, not realizing that the judge might need additional information concerning the defendant's disability. Thus, in addition to the contradiction between the object and the instruments, there seems to be a systemic contradiction between a fundamentally *unpredictable object* and *inflexible division of labor*. These two contradictions are schematically depicted in Figure 2.6 (which is an extension of the first action in Figure 2.4).

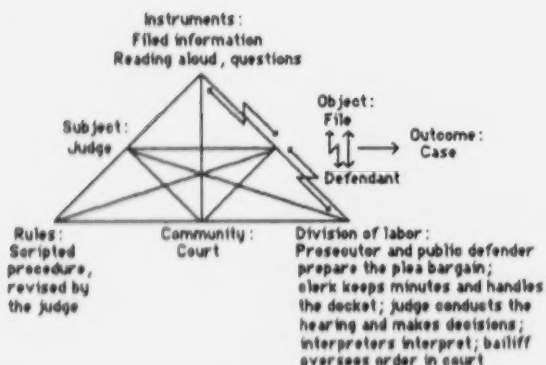


Figure 2.6: The contradictions behind the disturbance in the California court

The disturbance is repaired with the help of a *collaborative action*, the sidebar conference between the judge, the prosecutor and the public defender - and subsequently with the help of the judge's determined use of the dialect of socio-economic adjustment.

At this point the contradictions identified above are only hypothetical constructs. Their validity must be tested and their nature further elaborated in analyses of more extensive and versatile data.

Keeping this reservation in mind, it is still instructive to consider the implications of the contradictions. In the Finnish court, the crucial component causing tension seems to be the rather inflexible procedural script. The script makes it difficult for the judge to adjust the sentence to the life situation of the defendant. In this script, there is one strategic component which potentially invites disturbances, namely the question 'Do you have anything else to say?' at the end of the second standard action. The expected standard answer is 'No'. But there is a qualitative difference between this 'No' and other 'Yes/No' answers the defendant is expected to give. The other answers have already been recorded in the documents and the judge is only checking that the defendant confirms what he or she has previously stated. However, the answer to the question 'Do you have anything else to say?' is by definition not previously recorded. In that sense, this question always carries a possibility of an unexpected deviation from the script.

Prevention of repeated or accumulated offenses by adjusting the sentence to the life situation of the defendant is not a built-in feature in the procedural script of the Finnish court. However, Mr. HK's interview indicates that driving

without a licence - which invites an accumulation of offenses - is a very real possibility.

In the California court, the procedural script, revised by the judge, is more flexible, corresponding to the much bigger and more complicated caseload in which the issue of repeat offenders is crucially important. But this flexibility is not reflected in the instruments and in the division of labor. To the contrary, the instruments - above all the standard forms contained in the case file - are so streamlined that they seem to make it nearly impossible to store and transmit more freely formulated, content-rich information about the case. And the division of labor effectively compartmentalizes the judge, the public defenders, and the prosecutors into their own relatively closed niches, making it difficult for them to see the activity and its emergent situations from each other's viewpoints.

This latter point may be compared with Seron's (1990) observation according to which the new organizational model of American courts relies increasingly on teamwork. In the California court analyzed here, teamwork between the different professional groups surfaced only as an emergency measure to repair disturbances by calling a sidebar conference. Seron may well be right when she notes that teamwork will eventually transcend bureaucratization and depersonalization in courts (Seron, 1990, p. 461). But at least in the setting analyzed in this paper, this transcendence is yet to take shape.

NOTE

1 Although this paper speaks in the voice of the first author, it is a product of collective work. The following members of my research groups collaborated with me in the preparation of this paper: In Finland, Juha Pihlaja and Vaula Haavisto, both of the project 'Developmental Study of Work in Municipal Courts' at the University of Helsinki. In the United States, Katherine Brown, Ritva Engeström, Judith Gregory, Robert Taylor and Chi-Cheng Wu, at the time all of the Laboratory of Comparative Human Cognition at the University of California, San Diego.

The research reported in the paper has been financed by grants from the Finnish Ministry of Justice and from the Committee on Research of the University of California, San Diego. Views expressed in the paper are solely those of the author.

I am grateful to the judges, other personnel, and clients of the two courts from which the data in this paper was collected. Michael Cole, Chuck and Candy Goodwin, David Middleton, Bud Mehan, Don Norman, Roger Säljö and Lucy Suchman have given valuable comments on different versions of the paper.

3. COORDINATION, COOPERATION, AND COMMUNICATION IN COURTS: EXPANSIVE TRANSITIONS IN LEGAL WORK

INTRODUCTION

Work in courts of law is among the most formal and rule-based processes in industrialized societies. However, the intricate division of labor in court organizations and the increasing complexity of the contents of cases give rise to various kinds of disturbances and unexpected contingencies in interactions inside and outside the courtroom.

In the United States as in many other countries, courts face rapidly growing caseloads with much less impressive growth in the numbers of judges and other personnel. As Heydebrand and Seron (1990) show, the way to cope with this dilemma has been increasing rationalization. The means of rationalization include novel techniques of scheduling as well as increasing reliance on magistrates, probation officers, and law clerks instead of judges only. Most importantly, they include new mechanisms for resolving and settling cases before they enter the stage of a full-scale jury trial.

Rationalization is often regarded as synonymous either to bureaucratization in the Weberian sense, or to assembly-line Fordism. On the basis of a careful historical and statistical analysis, Heydebrand and Seron (1990, p. 157) demonstrate that rationalization in courts is a much more open-ended endeavor.

"The growth and complexity of the organizational structure of courts is an undeniable development. But there are few signs that such growth is bureaucratic in the sense of Weber's model. Judicial case management has clearly played an important role in the rise of no-action and pretrial dispositions. Yet, the mandatory settlement conference or other pretrial mechanisms of dispute resolution are not necessarily 'bureaucratic' since they involve a host of *informal* procedures that deviate from the formal adversary-adjudicatory model alike. What is perhaps more crucial (...) is *how* these conferences are conducted, what mix of formal rational and informal-social elements they use, and what innovative alternatives they admit into their arsenal of conflict resolution techniques."

Heydebrand and Seron (1990, p. 156 and 157) further observe that the developments in court organizations particularly in metropolitan areas "point to the emergence of a highly elaborated network of organized activities" while many judges' orientation and policies may be changing "from that of formal adjudicators of cases to that of informal processors of disputes." In this light, I hypothesize that the currently emerging zone of proximal development

(Engeström, 1987) for work activity in courts looks something like the gray field in Figure 3.1.

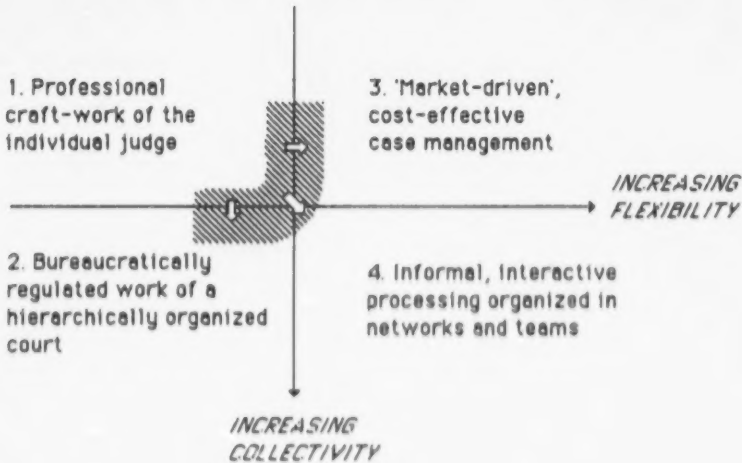


Figure 3.1: The hypothesized zone of proximal development for work in courts

Figure 3.1 implies that the zone of proximal development is a terrain of constant ambivalence and struggle between at least three alternative directions (fields 2, 3 and 4). The struggle is manifested in ruptures, disturbances and expansive innovations in the routine flow of work.

I will look at one complex case of civil litigation that took place in the spring of 1991 in the superior court of a large city in southern California. The case involved a dispute over construction defects found in a 240-unit condominium complex. The homeowners demanded approximately six million dollars from the developer for repair of the defects. After a year and a half of pretrial procedures and settlement attempts, the case went to a jury trial. The trial lasted two weeks, one week less than estimated by the judge and the attorneys. Forty-three witnesses testified and more than 200 exhibits were introduced (the two parties had originally prepared more than seven hundred exhibits).

This case exemplifies the increased complexity of many cases of civil litigation. It also also represents a test case for the independent calendar and the delay reduction program, a case management strategy for dealing with the volume of litigation in which the judge handling this case is an active practitioner.

THEORIZING EXPANSIVE TRANSITIONS

In analyses of work, a crucial question is how to combine the subject-object and the subject-subject, or the instrumental and the communicative, aspects of the activity. Arne Raeithel (1983) and Bernd Fichtner (1984) suggest a three-level notion of the developmental forms of epistemological subject-object-subject relations. The three levels are called *coordination*, *cooperation*, and *communication*. I shall briefly sketch my interpretation of these levels and of the possible mechanisms of transition between them.

I will call the normal scripted flow of interaction *coordination*. The various actors are following their scripted roles, each concentrating on the successful performance of the assigned actions, or on 'the presentation of the self' (Goffman, 1959). The script, coded in written rules and plans or tacitly assumed traditions, coordinates their actions as if from behind their backs, without being questioned or discussed (Figure 3.2).

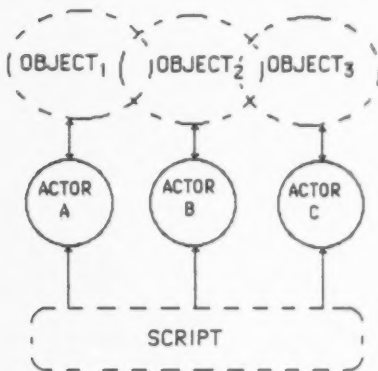


Figure 3.2: The general structure of coordination

In this and the following two diagrams, the unbroken boundaries indicate that the entities are in the focus of the subjects' critical attention. The broken boundaries indicate that the corresponding entities are not in the focus of critical attention for the subjects.

By *cooperation* I mean modes of interaction in which the actors, instead of each focusing on performing their assigned roles or presenting themselves, focus on a shared problem, trying to find mutually acceptable ways to

conceptualize and solve it. The participants go beyond the confines of the given script, yet they do this without explicitly questioning or reconceptualizing the script. Transitions to cooperation may occur in interactions between various practitioners or between professionals and lay clients. The general structure of cooperation is depicted in Figure 3.3.

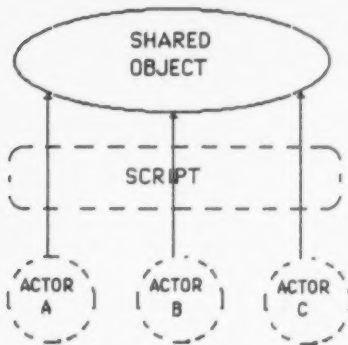


Figure 3.3: The general structure of cooperation

By reflective *communication* I mean interactions in which the actors focus on reconceptualizing their own organization and interaction in relation to their shared objects. Both the object and the script are reconceptualized, as is the interaction between the participants. Transitions to communication are rare in the ongoing flow of daily work actions. The general structure of reflective communication is depicted in Figure 3.4.

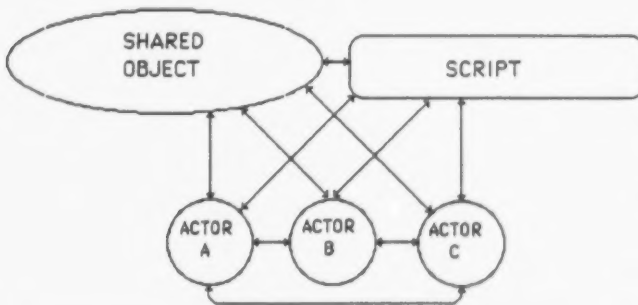


Figure 3.4: The general structure of communication

The mechanisms of transition between the levels include disturbances, ruptures, and expansions (see Engeström, 1991; also Chapter 1 of this volume). Disturbances are unintentional deviations from the script. They cause discoordination in interaction, which in turn may lead to (a) disintegration (e.g., confusion and withdrawal), (b) contraction (e.g., by authoritative silencing of some actors, or by softer evasion), or (c) expansion (i.e., collaborative reframing of the object by moving to cooperation or communication). Expansions may also occur without being triggered by immediately preceding disturbances.

While disturbances are deviations in the observable flow of interaction in the ongoing activity, ruptures are blocks, breaks or gaps in the intersubjective understanding and flow of information between two or more participants of the activity. Ruptures don't ostensibly disturb the flow of the work process, although they may often lead to actual disturbances. Ruptures are thus found by interviewing and observing the participants outside of after the performance of work actions.

Disturbances, ruptures and expansive transitions are crucially interesting as manifestations of the zone of proximal development of the activity system. I am especially interested in what facilitates expansive transitions, in particular what kinds of linguistic and other tools are used and invented to initiate and complete them.

DISTURBANCES AND EXPANSIONS IN COURT: THE QUESTION OF DATA

Since court proceedings are excessively scripted and well rehearsed, it is not necessarily easy to observe deviations from the normal in court. This is particularly true of trials where the parties are represented by skillful lawyers, much less so of cases where lay persons are directly involved (for examples of the latter, see Conley & O'Barr, 1990; Engeström & al., in press; Merry, 1990). In the case analyzed here, the absence of visible deviations became a prominent problem. The litigating parties were very smooth, polite and flexible in their interactions. Toward the end of the two-week trial, we were increasingly worried because no data on disturbances was coming in on videotape.

During the trial, procedural disagreements between the parties are commonly handled by means of so called sidebars. When one party objects to a move by the other party, either one or the judge will usually call a sidebar conference. These conferences are short breaks in the procedure where the judge hears the

procedural arguments of both parties and makes his or her ruling on that basis. Sidebars often take place in the courtroom, in front of the bench. In our case, they were held in the judge's chambers adjacent to the courtroom. Usually an observer has no chance of hearing or recording the contents of the sidebars.

In the present case, the judge habitually asked the official court reporter to join in the sidebars. This gave us the idea of analyzing the official sidebar transcripts as data on disturbances. Sidebars are indeed disturbances by definition. They break the normal flow of interaction in the courtroom, and the judge is often quite conscious of the fact that they annoy the jurors who cannot hear or understand what is going on in the sidebars. To my knowledge, sidebar transcripts have thus far not been systematically used as data in studies on court interaction.

During this trial, 19 sidebars were held in the presence of the official court reporter. The transcripts of these sidebars are the data analyzed for this paper. Courtroom transcripts prepared by researchers from videotapes representing phases immediately before and after sidebars differed from the corresponding transcripts prepared by the court reporter only in very minor ways. This indicates a high verbatim accuracy on the part of the court reporter (see, however, the excellent discussion of Walker, 1986, on the myth of the verbatim record). In the excerpts presented below, we reproduce the official court reporter's transcripts, deleting only names and other identifiable terms and adding necessary contextual information in parentheses [].

RETURNING TO COORDINATION BY CONTRACTION

The most typical way of dealing with a sidebar is that of returning to the business as usual by means of a quick unilateral decision from the judge. This is exemplified in excerpt #1.

Excerpt #1

[Direct examination of plaintiff's witness Mr. W by the plaintiff's counsel Mr. G]

Mr. G: Mr. W., in -- are you personally aware, given your special knowledge, skill and expertise, of how much it actually costs to move people from their homes and then to move them back into their homes?

Mr. W: I am aware of some of some of the costs, based on what we have done in the past.

Mr. G: All right. And based upon your special knowledge and expertise, what has it cost homeowners in the past in condominiums such as D [the name of the complex under litigation]?

Mr. V [one of the two defence counsel]: Same objection, your honor.

Mr. G: It is facts.

Mr. V: The objection wasn't on foundation.

[The judge leads the parties into a sidebar. The following takes place in the judge's chambers without the presence of the jury.]

The judge: Maybe I am not tracking. Now, what is it that you say? There was actual discovery on this?

Mr. G: Oh, yes, your honor. It was in the deposition.

The judge: So, let's go back, then. What was the basis for the objection?

Mr. V: Beyond the scope of the expert designation in the case. There was a motion in limine granted to limit the experts to the scope of the expert witness declaration filed by counsel. Nowhere is Mr. W. designated as an expert on moving costs. He is an expert on costs to repair. He is a general contractor. And this testimony goes beyond the scope of his designation, even if it was disclosed in deposition.

The judge: All right. It is overruled. I will consider the cost of repair. You can proceed.

[The parties return to the courtroom.]

The judge quickly eliminated this disturbance by means of one type of authoritative silencing. He heard the arguments of both parties, then decided in favor of the plaintiff without further discussion.

In spite of the rather straightforward nature of this interaction, certain hesitation and ambivalence may be observed even here. First the judge seems to regard the very sidebar as unnecessary: "Maybe I am not tracking." He seems to be ready to make a unilateral decision right away: "So, let's go back, then." But he backs up and hears the defence argument. Only after that he reconfirms his initial decision.

The pattern of contraction by authoritative silencing was followed in 12 of the 19 sidebars. In every single one of those there were interesting minor ambivalences, as if implying an emerging fundamental instability in this pattern.

TRANSITIONS TO COOPERATION

There were six sidebars in which an expansive transition into cooperation (Figure 3.3) took place. Instead of sticking to their assigned roles as adversaries and as an objective authority figure, the parties and the judge embarked upon joint construction of a novel problem and novel solution. The production of the new in these occasions resembles what Weick (1979) calls enactment and Rittenberg (1985) characterizes as objectification of situated meaning. Excerpt #2 gives an example of such an expansive transition.

Excerpt #2

[Direct examination of plaintiff's witness Ms. P by the plaintiff's counsel Mr. G]

Mr. G: Other than the water stain beneath that window on the wall and the water stain in the living room ceiling, are there any other concerns or complaints about the condition of your condominium?

Ms. P: Yes, there are. I also have -- Shall I go on?

Mr. G: Yes.

Ms. P: I didn't realize it was a problem, because the fire investigator --

Mr. V: Objection, your honor.

The judge: Sustained. What we are interested is things that you know about rather than what somebody has told you.

Ms. P: I know about it now, though, because --

The judge: I mean, that you observed, you know, yourself, other than something that somebody said. Go ahead, Mr. G. You take over the questioning. (Laughter)

Mr. G: Thank you, your honor.

Ms. P: I don't understand. I am sorry.

Mr. G: What are you talking about? What condition have you seen that you are now concerned about?

Mr. V: Could I have a sidebar for a minute, please?

[The following held in chambers between the judge and counsel.]

Mr. G: I am doing the best I can.

Mr. V: I understand. I think the danger that we are running into now is the area where she is going to testify that a fire investigator -- meaning Mr. H, in his volunteer fire department uniform -- came into her house and took out her light fixture. That's the testimony that was the subject of a motion in limine --

The judge: All right.

Mr. V: -- whether a fireman or a fire investigator determined that her light fixtures were a fire hazard. And that's the testimony that I wanted to avoid before we tried to unring the bell.

The judge: That makes sense. We've already talked about it. Can you -- will she avoid that? Will you talk to her about that?

Mr. G: I will whisper in her ear and say, "Don't mention anything about what somebody else said, and don't mention what he was wearing."

Mr. V: If she is talking about Mr. W and the fire investigator in the chimney, I don't have a problem with that. But if we are talking about Mr. H in his fireman's uniform, that's where we have the problem.

The judge: Just spend a minute and lay out to her the fact that she should just avoid referencing Mr. H and what he was dressed in or what he represented himself to be. He already testified. The jury knows. And go from there.

Mr. V: I have no objection if Mr. G leads Ms. P through the testimony.

The judge: Okay. That's thoughtful. She is nervous, so that might help.

Here the counsel and the judge are facing an unexpected problem. Essentially, the witness does not understand a crucial part of the script, namely the so called hearsay rule which prohibits using what others have told as evidence. The sidebar turns into shared problem solving. This is triggered by the initial disarming utterance of Mr. G: "I am doing the best I can." This unusually personal statement receives a sympathetic response from Mr. G's adversary: "I understand." Here the problem is redefined as no more an issue of contest. It becomes an issue of finding a mutually acceptable way of coaching or guiding the witness.

The rather striking innovation produced in this episode is that the defence counsel actually suggests that Mr. G should "lead Ms. P through the testimony." In the script, leading a witness is prohibited equally strictly as using hearsay. Now, however, the parties and the judge all agree that leading the witness is exactly what must be done. In other words, to avoid breaking the hearsay rule, another rule must be broken by joint decision.

Especially Mr. G and the judge use the linguistic tools of personalization and familiarization - recourse to everyday language - to achieve this expansive transition. The judge concludes the sidebar using the non-legalistic words "thoughtful", "nervous", and "help".

On the other hand, Mr. V uses the meta-linguistic tool of reflecting on the preceding discourse: "And that's the testimony that I wanted to avoid before we tried to unring the bell." The judge joins in, reflecting on a longer history of previous discussions: "That makes sense. We've already talked about it."

Perhaps the most sophisticated tool is used by Mr. G when he employs reported speech (Volosinov, 1971; Goffman, 1974; Goodwin, 1991) in a proactive, anticipatory fashion: "I will whisper in her ear and say, 'Don't mention anything about what somebody else said, and don't mention what he was wearing.'"

In the other five sidebars displaying a transition to cooperation, similar tools were used. Excerpt #3 is another example of the effective use of personalization.

Excerpt #3

Mr. S: (...) I could be wrong, Bob [addressing Mr. G], and if you have something.

The judge: All right. I am going to allow you to cross on this and if you are correct you'll look fine. If you are not correct...

Mr. S: I'll look silly.

The judge: Then you wouldn't look fine.

In a similar vein, excerpt #4 demonstrates the use of familiarization.

Excerpt #4

Mr. G: My thinking is that, in the first 5, 10, 15 minutes that they [the jury] are in there, we can quickly consider those items and get them into them --

The judge: Sure.

Mr. G: -- while they are still talking about the C's [name of the local baseball team].

ATTEMPTS AT REFLECTIVE COMMUNICATION

In one of the sidebars, there is a piece of discourse that seems to differ qualitatively from both authoritative silencing and cooperation.

Excerpt #5

[Held in the judge's chambers without the presence of the jury]

The judge: All right. I am going to allow him. But this is the other side of a problem that Mr. S experienced. And you can now -- both of you can -- so that -- the problems it causes, when new figures come in, and by making somebody available the night before at 5:15 really doesn't comply with what I have in mind in terms of the "spirit of cooperation." It might have been the only time that he was available or the time that you were available, but, really, when I -- if I make this kind of ruling in the future -- what I mean by that, to both counsel, is that you set up a time that's convenient for the other person and really break your backs to get that information.

In this excerpt, the judge is teaching or reminding the attorneys to follow the rules of cooperation. In that sense, the script itself as well as the interaction of the participants become the foci of attention. These are hallmarks of reflective communication (recall Figure 4). Yet there is something peculiarly non-communicative in the discourse. The judge is in effect presenting a monologue to which the attorneys do not respond in any noticeable way. The content is reflective communication, the form is non-communication.

When the judge refers to the "spirit of cooperation" he is not just talking about a general principle. He is referring to the contents of an issues conference, a special meeting he had with the attorneys immediately before the trial. This meeting is actually a tool with which this judge attempts to achieve reflective communication between himself and the parties of the trial.

The delay reduction program officially adopted by the court introduced a mandatory disposition conference to be held in good time before the trial. The issues conference, however, is the judge's own invention. In his interview, he characterized these two as follows.

The judge: The delay reduction program really is generated by the control of the case from the very first time that it's filed and answered, with mandatory deadlines for certain things to happen. And about two months before trial, the final thing before trial is the disposition conference. And they have to prepare a joint document, both sides or all sides, listing all their witnesses, all the issues they say are still unresolved, instructions, things that were unheard of to do ahead of time. Back when I still was practicing, you never knew who the other side's witnesses even were, and now you know two months ahead of time.

Interviewer: Did you have a disposition conference in this case?

The judge: No, because I had the case managed so that I told them to file their witness list and things, they did it on an informal basis.

Interviewer: So you didn't have to have it all at once in writing?

The judge: Exactly. And they were working well enough together so I didn't require them to file this formal disposition conference document that requires both their signatures. But that funnel-shaped item is a reduction with dates and fines, money fines, sanctions, if you don't live up to them. Very negative.

Interviewer: Now the issues conference, that is really your own tool. How is that related to the disposition conference?

The judge: That disposition conference, that's a formal document. And I take the disposition conference report, and I say, okay, this is what you've said, but now we're right down to trial, and what is the reality of this?

Interviewer: So the issues conference is really about the trial in actual practice?

The judge: Right, exactly. And we are going to trial on this. They've been sent out -- Every case, two months ahead of time, files a disposition report, conference report. But not every case goes down to trial. And these people actually are, they show up at my door step, supposedly ready for trial. Now, because I'm usually in trial, I'm not ready for 'em that day. So I'll have an issues conference for them, which says, now you've said you're ready for trial, but let's make sure we are.

(...)

The judge: I mean, we talked over some potential things. It gets timelines set up and gets when people expect things to happen, and gets 'em in the frame of mind that I want them in when they try a case here.

(...)

Interviewer: Did you invent that or did you learn it from somebody else?

The judge: No, I invented it because I found that I was talking about the same things with these people in front of me, the same time, so I just started keeping a list and then I'd add something. Then I made the list, then I typed it

out. Then I put, y'know, it just grew, just one of those things that grew. But it's helpful.

The list to which the judge is referring is an artifact created by the judge to sustain and consolidate the innovation. It is his standard agenda for an issues conference. It contains 17 items. The last item on it is simply "Work together". According to the judge, one of the aims of the issues conference is to make sure the parties will focus on the essential questions in the case, not confusing the jury by diverting into insignificant details. Another aim is to reduce the anxiety of the parties, to get them to collaborate and interact self-consciously. These aims speak of the judge's intention to reach reflective communication in the process of complex litigation.

We taperecorded the two-hour issues conference preceding the case. The contents of the conference corresponded to the agenda.

On the quality of interaction:

The judge: Ah, so, I just want you to understand that I don't, I don't want me, er, to sound like I'm lecturing you but that is a real important thing, as I sit here, that I wasn't as sensitive to, ah, when I was sitting where you are. So I am now, and that will be a lot of my, my feeling as to keep the jury, ah, respectful of the process. It's real important. Now, with that in mind, it's the philosophy I want between you two, and I say two because of the size, I don't know who will be trying the case, is that I want you to assist each other in putting your cases on. The time for gamesmanship, or trial by ambush or, ah, tactics that make the other attorney look bad, ah, are over, as far as I'm concerned. So, when - when Mr. G, when your witnesses are going on, on Monday afternoon, or Tuesday, ah, I want you to tell Mr. S who they are going to be, and about how long they'll take. I'll direct, Mr. S I want you to do exactly the same thing. Everything in this courtroom applies both ways, so, eh, when your case is on I want you to cooperate with each other.

On the mutual definition of the object:

The judge: (...) Ah, take a look at his verdict form. The only reason that I want, and I want you, if there's something dreadfully wrong with it or if it doesn't, or if it isn't this case that we're trying, then I want you to prepare a verdict form that you think reflects the case. The reason is simple. PM [name of another judge] was talking about this early, about a year and a half ago when I first started. And I thought it was ludicrous until I had about twenty trials where at the last day of trial nobody could agree on the verdict form because they had been trying, essentially, a different case. They said, "Well, gee, we, we didn't present any evidence on these elements here, you know,

because we thought we were trying this case over here." And this is the last day of trial. Then what will I do? Well I've learned if, if you at least show each other the verdict form early in the case, ah, if there's a great deal of difference then, ah, let me know. I mean, I'll look at them both and it will give me an idea anyway. At least I know that you agree on what elements of each, ah, cause of action. (...) Ah, I don't care if you agree at this point. I just want you to have exchanged one. Or if you're satisfied with the one that's produced, fine. We're trying the same lawsuit. You don't have to agree to individual language. But you know what I'm talking about.

Mr. G: Yes, sir.

The judge effectively uses reported speech, among other means, as a tool to convince the attorneys. Yet there is no interaction except the mandatory "yes, sir" from one of the attorneys. In the issues conference, the attorneys took initiative and talked actively only in matters requiring technical coordination for the trial. In other words, the communicative contents were all but nullified by the non-communicative form of the discussion.

What could be the reason for this? Obviously it may be the judge's habitual dominating or lecturing style that precludes interaction. But the attorneys were experienced and not at all timid. They could have responded more actively if they wanted.

A more plausible explanation is found in the post-trial interviews of the attorneys. First the plaintiff's side.

Interviewer: He [the judge] also uses what he calls the issues conference just before the trial. We were actually present when that took place on Friday just before the trial. And, I was wondering, did you find it useful? First of all, is that a common procedure?

Mr. G: Oh, it's usually that it's a month before the trial. Three weeks to a month. And it is important to do that three weeks to a month, from both parties' point of view. And I was critical of the judge for having and holding that issues conference so soon before trial. Things occurred in trial. Now, it was a very efficiently run trial and it went fast. But there were several sidebars there that occurred that wouldn't have occurred had they been talked about in the issues conference. We also call it a disposition conference, the terms are used interchangeably. And, you talk about the law. Like, what's the law here? [laughs] What are you going to tell the jury the law is? And, let's rule on the admissibility of some of these exhibits before we go and prepare them or blow them up.

Then the defence side.

Interviewer: There is a particular situation where we were actually present. And that was what he [the judge] calls the issues conference, which was just the last Friday before the actual trial. And it seemed to be somewhat of an invention of the judge. He has this list of things that he went through. What did you think about it, was that useful or sensible?

Mr. S: Actually it's very useful and that's one of the new things that our court system has, it's called 'the fast track'. And this is part of the fast track procedures. The idea is that we're gonna have this issues conference, usually that occurs about a month before trial, to sit down and make the attorneys have this case ready for trial a month beforehand. So that when the trial comes, we can get it done a lot more quickly and efficiently. They tell you, you determine what evidence is gonna come in, what witnesses are gonna be there, work out all your problems, come with a list of what the exhibits are, and basically you're ready to go with trial and it's gonna go smoothly on this game plan.

Interviewer: This time you had it just before the trial.

Mr. V: Because the subs [the subcontractors] were still in.

Mr. S: It was all because the subs were still in and he didn't want to have it until he made a decision as to whether or not the subs were gonna get out. Because if the subs were involved, it would have been much more complicated.

Interviewer: Did you feel it was problematic so close to the actual trial date?

Mr. S: We didn't. The plaintiff did.

So both attorneys confuse the issues conference with the disposition conference. This is something the judge explicitly rejected in his interview cited above, empathically pointing out the crucial difference between the two conferences. Somehow the judge's entire innovation has been misunderstood by the litigating attorneys. This is a prime example of a *rupture* that effectively prevents an expansive transition from being realized. One wonders what would have happened had the judge prepared the attorneys by simply telling them the same things about the issues conference he told us.

THE INVISIBLE BATTLEGROUND

The data presented above tell about the zone of proximal development as an invisible battleground. In the ongoing work activity, disturbances occur continuously. Disturbances are dealt with both regressively and expansively. Innovative solutions appear. But innovations may be blocked by ruptures in the intersubjective understanding between the participants of the activity system.

In Figure 3.1, I presented a tentative picture of the zone of proximal development in the work activity of courts. The judge in the present case was

an active proponent of the delay reduction program and the so called independent calendar adopted by the court. Both are reforms that might be placed in the individually mastered cost-effective case management represented by field 3 of Figure 3.1. However, the judge's attempt to reach reflective communication by means of the issues conference is more characteristic of the informal and interactive teamwork represented by field 4 in Figure 3.1. Perhaps the persistent lecturing style in his approach to the attorneys represents the heavy tradition of field 1.

The expansive transitions found in the sidebars could not have been achieved by the judge alone. To the contrary, excerpt #2 is a good example of a transition in which the innovation emerges through an effort pretty equally distributed between the two attorneys and the judge. What is missing is conscious input from the lay witness, or lay clients more generally. Perhaps this would be going to the far end of the current zone of proximal development in complex litigation work?

NOTE

1 Although this paper speaks in the voice of the first author, it is a product of collective work. Katherine Brown, Carol Christopher, and Judith Gregory, all members of the Research Group on Expertise as Collaborative Activity at the Laboratory of Comparative Human Cognition, University of California, San Diego, collaborated with me in the preparation of this paper. The research reported in the paper has been financially supported by the Committee on Research of the University of California, San Diego.

I am grateful to the judge, the attorneys, and court personnel for their collaboration in the collection of the data on which this paper is based. Phil Agre, Alexandra Belyaeva, Aaron Cicourel, Donald Norman, William O'Barr, and Steve Reder have given valuable comments on different versions of the paper.

4. TWISTING THE SCRIPTS: HETEROGENEITY AND SHARED COGNITION IN MULTI-PROFESSIONAL MEDICAL TEAMS

INTRODUCTION

In the conceptual models of coordination, cooperation and communication presented in Chapter 3, the notion of script deserves special attention. Scripts evolve historically to codify and regulate standard procedures in repeatedly occurring cultural situations. Although the script may be available in a quite explicit form (e.g., as a written formula or rule), the participants in a scripted event are seldom aware of the script they are following. The script has an algorithmic, stepwise character, dictating the sequence of events from the beginning to the end. In cognitive psychology, a script is characterized as follows.

"(...) the script is basically an ordered sequence of actions appropriate to a particular spatial-temporal context, organized around a goal. The script is made up of slots and requirements of what can fill these slots. That is, the script specifies roles and props and defines obligatory and optional actions by actors who fill reciprocal roles. For each slot there are default values that are assumed if the person, object, or action is not specified when the script is instantiated in a particular context. For example, in the prototypical restaurant script a waiter or waitress is assumed, as are a menu, food, a bill, and a tip. Persons hearing a story about a restaurant can readily fill in these items from their general script knowledge." (Nelson, 1985, p. 40; see also Nelson, 1981; Schank & Abelson, 1977).

While cognitive scientists use the notion of script primarily to understand and characterize individual cognition, my research will focus on the cultural and social aspects of script-related cognition. How do scripts emerge and develop in teams located in different cultural contexts? How do team members jointly follow, violate, modify and change their scripts?

Due to its rule-like character, the script is a very peculiar cultural artifact. It could be characterized as a tool turned into a rule. In the present context, I will distinguish between the script and artifacts that have predominantly a tool-like instrumental function. Such artifacts are important mediators of organizational cognition (e.g., Engeström, 1991, Chapter 6; Gagliardi, 1990).

In the models depicting coordination, cooperation and communication (see Chapter 3), artifacts, including linguistic tools, should be located as mediators between the actors and the objects. On the other hand, such conventionalized and ready-made ways of packaging speech as Bakhtin's (1986) speech genres

are more accurately viewed as implicit constraints or rules rather than tools of interaction. In this sense, speech genres are very closely related to scripts.

The form and contents of spoken interaction in group meetings may be strongly dependent on the external artifacts used by the participants before and during the meeting (Virkkunen, 1991). Such artifacts may be divided into

**preparatory artifacts* (e.g., written agendas and notes);

**process-monitoring artifacts* (e.g., spatial arrangements and positionings in the meeting room, forms of record keeping in the meeting);

**orienting, evidentiary or argumentative artifacts* (e.g., models, pictures, statistics, etc. used to focus attention on a topic or object, or to support and illustrate one's argument); and

**transmission-implementation artifacts* (e.g., documents containing the decisions of the meeting, to be distributed or used as legitimation devices).

There are at least three important dimensions to be observed in analyzing the roles and uses of such artifacts. First, *access*: is the artifact shared by the participants or is it used exclusively by one or some of them. Second, *penetration*: does the artifact represent the objects of the work activity in the external world or does it represent layers of 'pseudo-objects' functioning as blankets of mufflers between the objects and the participants. Third, *epistemic function*: do the artifacts function as prototypical examples and devices of identification ('what' artifacts), as procedural instructions ('how' artifacts), as diagnostic and explanatory models ('why' artifacts), or as ideological symbols ('where to' artifacts) (Engeström, 1990, p. 171-195).

In her pioneering work, Schwartzman (1987; 1989; see also Granström, 1986) points out that meetings, although a pervasive form of organizational life, have been largely taken for granted and neglected by researchers. Naturally the detailed study of meetings must be embedded in observation and ethnography of actual 'on-line' work practices. The conceptual framework presented above and in Chapter 3 makes it possible to use meetings as particularly illuminating 'windows' into the developmental dynamics of teams.

THE SPECIFICITY OF MEDICAL TEAMS

Complex clinical procedures such as demanding surgeries self-evidently require collaborative teamwork. However, in such operative teams there is usually a very clear vertical command structure which makes the team more like a commando task force dedicated to a single purpose than a general-purpose form of organizing cooperative work and enhancing horizontal exchange of information across potential boundaries. Ideas of the latter type are fairly recent in health care.

Multiprofessional health care teams have been increasingly used and written about ever since the late sixties (e.g., Beloff & Willet, 1968; Lashof, 1968; Horwitz, 1970). One of the pioneering texts was Alberta Parker's (1972) monograph *The Team Approach to Primary Health Care*. Parker (1972, p.10) listed five characteristics of a functioning primary care team: (1) team members provide care to a common group of patients; (2) team members develop common goals for patient outcome and work to reach these goals; (3) appropriate roles and functions are assigned to and accepted by each team member; (4) the team possesses a mechanism that enables all to contribute and share information essential for effective patient care; (5) the team possesses a mechanism to ensure that patient care plans are implemented, services are coordinated, activities are administered, and the performance of the team is evaluated.

In practice, health teams are commonly confronted with difficulties that stem from the heavy traditions of craft professionalism and bureaucracy. As Tichy (1977, p. 7) notes, the health teams' "internal structure often has tended to replicate that of the hospital hierarchy." In a similar vein, Bruce (1980, p. 165) points out that "cooperation between professionals has not been found to result automatically either from physical proximity or from being involved with the same client."

Health care teams and their operating contexts are special in at least three respects. First, health care teams are often comprised of professions with very different training, ideology, and status and with a tradition of more or less open tensions between each other. Second, at least larger health care institutions have traditionally been very centralized and dominated by strong autocratic leaders, mostly MD's by profession. Third, frontline health care teams deal with clients who can decide whether they will or will not follow the recommendations of the professionals; thus the success of the team is dependent on the involvement and cooperation of the patient, which makes the client something of a co-producer of the services.

In the following, I will present data from two examples of health team interaction. I will analyze the examples with the help of the theoretical framework suggested above. The first example is a meeting between a client and two collaborating professionals, in the home of the client. The second example is a meeting of a primary health care team conducted at the health station. The data are taken from two successive projects of developmental work research in Finnish health centers, *Project LEVIKE* and *The Working Health Center Project*. In order to understand the cases, the reader should know that since 1972, every Finnish municipality is required by law to organize a health center that offers comprehensive primary health care services to the inhabitants free of charge. Health center personnel work in health stations as well as in schools and preventive guidance clinics.

CASE 1: THE OLD WOMAN AND THE PROFESSIONALS

Health centers and municipal social welfare agencies offer partially overlapping services in Finland, typically to clients like the elderly and alcoholics. To coordinate services and avoid excessive use of resources, the two branches are trying out various rudimentary forms of teamwork in many municipalities.

In case 1, such a form of teamwork was being developed between the home health care of the elderly (a function of the health center) and the home services for the elderly (a function of the social welfare services). The former delivers medical services to old people living at home but suffering from chronic illnesses. The latter delivers services such as cooking, cleaning, shopping, and often making sure the clients are taking their prescribed medications. The former services are typically delivered by home nurses who visit the home usually not more than once a week. The latter services are delivered by home service assistants who may visit the home even on a daily basis. Health visitors are trained nurses, medically supervised by physicians. Home service assistants don't necessarily have any special training for their job. They are supervised by a home service supervisor, usually trained as a social worker.

In this particular city, the health care and social welfare services were integrated administratively. But at the level of daily work, the two remained relatively isolated. The two branches decided to start ground level team collaboration by sending home nurses and home service assistants together to their shared patients in order to create a shared care plan for the client in question. The care plan is a structured document initially developed and used by nurses in the health sector.

In this case, the patient is an 80-year old woman. While being mentally and verbally quite alert, she has difficulties in moving around. The home service assistant visits her daily. The home nurse visits her approximately once a week. She is generally considered "a difficult patient" or "a difficult client" by the professionals.

The conversations that occurred between the home nurse (called nurse for short), the home service assistant (called assistant for short), and the patient (called Alma in the conversation) during this visit were tape recorded by another employee of the health center. She was otherwise not directly involved with the work of either one of the two professionals. The following excerpts illustrate the structure of interaction during this visit.

The participants have been discussing the patient's various medications and related symptoms.

Excerpt 1

01 Patient: Dr. A gave me O [name of a tranquilizer], and I took two pills a night. One nurse almost got a stroke when she saw it. So one would be enough, not more in any case. Then it was reduced.

02 Nurse: Perhaps that anyway. Are you writing these down for yourself? [to the assistant]

03 Assistant: Yes.

04 Nurse: And that tranquilizer thing. It could be her problem, using tranquilizers. Now it's not, if she wouldn't use those...

05 Patient: [speaking over the nurse] I had such a terrible pain on Saturday, such a hard pain.

06 Nurse: Should we write down that she likes to take extra pills of O, grown fond of O [name of the tranquilizer]?

07 Assistant: Hm. I'll make a clean copy of this, then.

[Short pause; both professionals read their versions of the care plan.]

In this excerpt, the patient initiates discussion on tranquilizers and tells that her prescribed dose has been reduced. The nurse picks up the topic and states that the patient has a problem of excessive use of tranquilizers - an interpretation not at all coordinated with what the patient told. The professionals then proceed to formulate a statement about the patient's tendency to excessive use in their care plan document, ignoring the patient's remark about a terrible pain (turn 05).

Excerpt 2

01 Nurse: Then there's the functioning of the stomach. It's one...probably the biggest one.

02 Assistant: Yes.

03 Nurse: And for that we have this trip notebook?

04 Assistant: Yes, there's again in it, I guess, yeah, I guess, from the weekend. [she is referring to a trip notebook in which all the home service staff who visit the patient are supposed to enter their notes concerning the visit; during the weekend other home service staff than the regular assistant have visited the patient]

05 Assistant: On Friday I wrote down...

06 Nurse: Which Friday, this?

07 Assistant: Yes. I wrote down kind of... about the whole week.

08 Nurse: Yes.

09 Nurse: The stomach has been constipated again.

10 Assistant: I wonder if Saturday's visitor has even read this?

11 Nurse: Yes.

12 Assistant: Probably not... Hm, I was thinking [lowering her voice] if Alma has told...?

- 13 Nurse: Just so.
 14 Assistant: Since this has been all week now.
 15 Nurse: Yes, the last time I looked at the trip notebook it said the stomach has functioned well.
 16 Patient: Don't I have something to say about my own care?
 17 Nurse [raising her voice]: Yes, of course.
 18 Patient: It can't be dictated by others, can it? According to the existing law...
 19 Nurse: We are just checking, checking out the functioning of the stomach.
 20 Patient: According to the existing law.
 21 Nurse: Yes, we are only looking into the functioning of that stomach, because.
 22 Patient: All the time I feel like my bowels were moving, but nothing comes.
 23 Nurse: Yes.
 24 Patient: It is...
 25 Nurse: Well, according to this trip notebook, however, the stomach is functioning.
 26 Patient: It contracts and contracts, the muscle, but only very thin stuff comes out...
 27 Nurse [speaking over the patient]: But according to this notebook, the stomach functions anyway... every day [lowering her voice toward the end].

Here the patient interrupts and confronts the professionals, forcefully demanding their attention (turns 16, 18, and 20). The patient claims her stomach does not function. The nurse responds by referring to the trip notebook according to which the patient's stomach has functioned every day during the week. Suddenly we are in the absurd situation where the professionals hold their notebook contents as evidence against the patient's claim about her quite personal life functions.

These excerpts are representative of a long series of confrontations during the visit. All follow the basic pattern, with variations in contents and in degrees of aggravation.

The structure of this sequence of interaction may be interpreted as follows. The professionals are interacting quite intensively. Their script is the structure of the care plan. They focus on the construction of a shared care plan for the patient. In his sense, their interaction looks like genuine cooperation. However, the care plan effectively muffles the voice of the patient. It is a substitute object that prevents the professionals from focusing on the patient as subject. In other words, the interaction has the structure of pseudo-cooperation.

The professionals use the trip notebook as a mediating artifact from which they glean information for the construction of the care plan. It is used as an evidentiary or argumentative artifact, to prove that the patient's stomach has actually been functioning, no matter what the patient says. With regard to

access, the professionals 'own' the trip notebook while the patient is excluded from using it. With regard to penetration, the trip notebook could well be used as a means for discussing the patient's needs - now it is restrictively subordinated to the preparation of the care plan. With regard to its epistemic function, the trip notebook is used as a 'what' artifact, helping to identify and classify 'facts' about the patient.

The structure of the pseudo-cooperation in this episode is complicated by the active presence of the patient. She has her own object: her felt needs, her desire to be acknowledged as a subject of her own. She is following a grievance script, taking up a long string of problems and needs, one at a time - and thus disturbing time and again the professionals' agenda of constructing an appropriate care plan document. This tension takes the form of repeated discoordinations, from occasions where the professionals ignore what the patient says to occasions of open confrontation.

This complex structure of pseudo-cooperative and simultaneously extremely discoordinated interaction is schematically depicted in Figure 4.1.

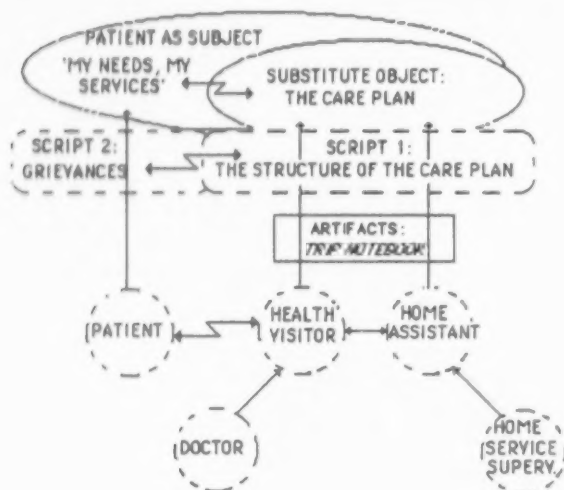


Figure 4.1: The structure of discoordinated pseudo-cooperation in case 1

This case demonstrates how the care plan which originally is supposed to function as a shared tool can be turned into a monstrous caricature, a pseudo-object, that dictates the interaction of the professionals instead of helping them to interact with the patient. Such a displacement is not uncommon. The case

also demonstrates how helpless team members can be when faced with a demanding client - a live object from the outside world. The discoordinations do not lead into innovations and expansive transitions. They are met with various forms of evasion.

CASE 2: THE TEAM AND THE HIERARCHY

My second example is taken from a joint meeting of two teams working at a health station. The teams have been functioning for two years. They consist of the personnel responsible for treating ill patients in consultations at the station and in home care. Each team comprises of four physicians, two assistant nurses, a nurse working at the station, and home care personnel who are mainly in the field and usually represented by one or two home nurses in team meetings. Each team is responsible for a given sub-population and the corresponding geographical area. The teams don't have fixed leaders. All team members regardless of profession take turns as coordinators. The teams meet separately once a week. Once a month they have a joint meeting.

The principle of population responsibility pertains to the teams. The teams have an outspoken stance for autonomy and self-initiative in decisions concerning their own work. But there are other functions in this health center that are not organized on the basis of population responsibility. At this fairly small station, the laboratory represents such a function. It is still supervised by a head nurse specially in charge of the laboratory sector and located at the central board of health in the administrative center of this relatively large city. There is a history of tensions between the teams and the laboratory, as well as between the teams and the traditional sectorially organized administration in general.

The meeting takes place in September 1991. The previous summer, the central administration closed the laboratory in order to save money. There is a strong possibility that the head nurse in charge of the laboratory sector will propose closing that laboratory permanently. The closings do not threaten the jobs of the lab personnel; they are transferred to a bigger station with a bigger lab.

In the meeting, the teams discuss the closing. They have prepared a draft letter to the central administration demanding that the laboratory shall not be closed. About fifteen team members, two representatives of the laboratory, and the chief physician of the district where the station was located participated in the meeting.

The following statement by a home nurse was quite typical of the turns taken by the team members in the discussion.

Excerpt 1

01 Home nurse: Well, for home care, at least, during the summer we had such a situation that we had summer substitutes, and they are usually students. And they don't necessarily even know how to take laboratory samples. Their skill with the needle is so meager that taking samples doesn't work. So the samples had to be taken by the few permanent home nurses. And the number of samples to be taken is the same as usual, even more in the past summer. Some of the patients refused to go to L (the next, bigger station which had a functioning laboratory). They have the strength to come to our station, but to L they need to take a taxi, or it's otherwise such an unfamiliar, frightening, big place where they don't find their way to the laboratory, particularly the elderly patients. So their opinion was that they cannot go to have lab samples taken in L. So we had to take them, so we nurses had a very busy summer, indeed. And we used quite a lot of our precious time for driving those samples to L for analysis. And there's one more point, namely that particularly serum samples are so sensitive that they are easily spoiled in the car, being transported from one place to another. In the lab the sample can be immediately stored in an appropriate place. But when they are driven around in car in the hot summer weather...

After this statement, other related issues were discussed for about five minutes. During that time, the chief physician expressed her support to the teams in their effort to secure the continuing laboratory services at their station. However, she advised them to formulate their letter so that the central administration cannot find any counter-arguments in it. After this, the following exchange took place.

Excerpt 2

01 Team physician: I think it's noteworthy that samples are getting spoiled. They must be redone several times. It costs money. On the other hand, the patient has to come to tests several times. And she may come to consultation to ask for results, but the sample has been spoiled again.

02 Lab nurse: Well, lab samples do not get spoiled in car transportation. Our samples make a long tour in a taxi...

03 Home nurse: Ah, yes...

04 Lab nurse: ... and there are containers for cold transportation. Samples do not get spoiled in a car. If they are spoiled, it happens already when they are taken.

05 Team physician: Maybe they were spoiled because of these inexperienced summer substitutes. But that's the same...

06 Chief physician: ...Since there was no lab personnel to take those samples. It does require professional skill, doesn't it?

07 Lab nurse: Well, sure professional skill. But in transport they won't get spoiled. That's what I wanted to point out.

This sequence is typical of the structure of interaction. The team members testify that the closing of the lab had disastrous effects on the patients as well as on the staff. The chief physician supports them, with administrative qualifications. And a few times the laboratory nurse interrupts, pointing out that some of the arguments have not been adequate, as if indicating that the participants lack knowledge of the special sphere of the laboratory. However, the lab representatives do not openly oppose to the letter drafted for the administration. When asked directly of their opinion, they merely point out that it was not them who decided to close the lab. The discussion results in the acceptance of the letter.

This sequence is dominated by the team agenda of protesting against the closing of the lab. The discussion proceeds in coordination along the lines of the script that aims at the acceptance of the letter. However, there is a latent competing script, represented by the laboratory staff. It manifests itself in occasional discoordinations, such as the one in the excerpt above.

The full objects of the team members and the laboratory staff are never spelled out; they can only be inferred. I suggest that the object for the teams is to establish the population responsibility as the rationale of the work at the station. The object for the laboratory representatives is to establish the legitimacy of sectorial specialism as the rationale of their work at the station. The chief physician's object seems to be twofold: population responsibility on the one hand, administrative rationality on the other hand.

The following exchange that occurred almost at the end of this part of the meeting indirectly illuminates the objects of the teams and laboratory staff respectively.

Excerpt 3

01 Team assistant nurse: We could naturally invite the head nurse of the laboratory sector to come and get acquainted with our activity. I've worked here for six years but I've never met her at the station. I wonder how much she knows about our activity and about work based on population responsibility. She pretty seldom visits here.

02 Laboratory nurse: We do meet her quite often, but...

03 Team assistant nurse: ...yes, but to visit here. I mean how much does she know about our way of working. We could give her an orientation and tell her about our idea.

After the letter to the administration was accepted, the floor was given to the laboratory nurse so she could tell about the needs of the lab. She complained at

length about the way laboratory work is constantly being disturbed by patients coming at a wrong time, not being well enough informed and instructed by staff in teams.

Excerpt 4

01 Laboratory nurse: ...So that patients should not be sent in vain to our door. But maybe they come even on their own...

02 Team assistant nurse: I do think lots of them come on their own. After all, they have been waiting for two and half months.

This little exchange exemplifies how this part of the meeting is a mirror image of the preceding part. This time the lab staff go through their own agenda, but they are disturbed by an occasional remark from the teams, such as the one above in turn 02.

The structures of interaction in these two steps of the discussion are presented in Figure 4.2.

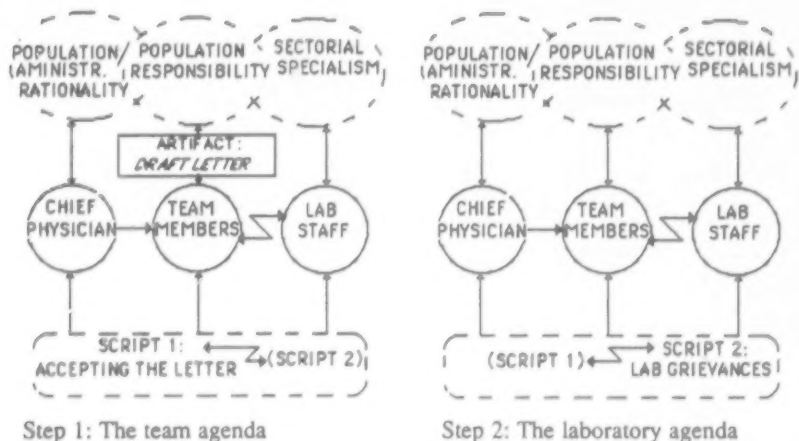


Figure 4.2: The two-step structure of coordination-discoordination in case 2

It is noteworthy that the only artifact ostensibly used in these parts of the meeting was the text of the draft letter. It was not distributed to the participants, only read to them by the team assistant nurse chairing the meeting. There was no concrete discussion on the specific contents of the letter. As such, the draft text seemed to function as a symbol of the identity of the teams rather than as an instrument of discussion. On the other hand, the

letter surely was used as a transmission and implementation artifact, i.e., as a message to the administration.

The rather straightforward coordination character of the interaction in the meeting was altered at one point, after the lengthy presentation of grievances by the laboratory nurse.

Excerpt 5

01 Team physician: Would it help if you put a big sign on the door of laboratory, which would say 'Only with appointment and acute samples'...?

02 Lab nurse: ...We can put there such a sign.

03 Team physician: And 'If you don't have an appointment, you can go to L station lab without appointment'. Not too much text, but so that patients will realize that there is such an arrangement in place...

04 Lab nurse: ...Yes...

05 Lab nurse 2: As little text as possible.

During this exchange, there is a change in the atmosphere. The team physician and the laboratory nurse both lean forward to look each other in the eyes. The laboratory nurses and the physician are suddenly talking about the same concrete object, out there in the 'real time' activity. The object nicely brings together the interests of the population responsibility and the interests of the laboratory specialists: informing patients will enhance their self-reliance and it will also help the lab get some peace and quiet.

This is a small but important example of an innovation leading to an expansive transition from coordination to cooperation. It did not resolve the tension between the team (population responsibility) and the laboratory (sectorial specialism) in any permanent manner. But it demonstrated that the tension is not unsurmountable. It is also important that the innovation proposed by the team physician did actually materialize. The sign is now out there, on the laboratory door.

The structure of the cooperation momentarily reached in this episode is depicted in Figure 4.3.

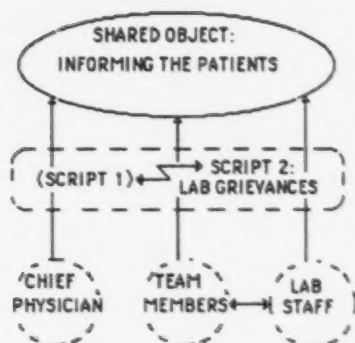


Figure 4.3: The structure of cooperation in case 2

CONCLUDING REMARKS

Both cases analyzed above deal with teams and teamwork in their early, formative stages. In both cases, the dominant script has not yet been crystallized. There is an ongoing search for a script, and a competition between scripts represented by the voices of different participants.

Neither case exemplifies neatly any one of the three strategies found by Ancona (1991), reviewed in Chapter 1 of this volume. In the first case, the professionals went out to the object in what looks like an example of the probing strategy. Yet they all but excluded their client, the patient, from the interaction. In the second example, the team seemed to focus entirely on its internal relations in a way that resembles Ancona's informing strategy. Yet there was an innovation that momentarily changed the nature of the interaction and led to a tangible artifactual product which can actually have impact on the exchanges between the professionals and their clients.

The evolution of scripts and artifacts in teams is a fascinating object of developmental study. More than that, our current research¹ involves teaching teams to analyze their meetings with the conceptual tools sketched above. Such new 'meta instruments' may or may not change the way teams design and monitor their own work.

NOTE

¹ The Working Health Center Project is involved in the transformation of work in 21 Finnish health centers across the country. The researchers of this project, Osmo Saarelma, Kirsti Launis, Raija-Leena Punamäki, Riitta Simola, as well as Helena Rantala, have given valuable comments during the preparation of this paper. The data used in case 1 was provided by Kirsti Launis.

REFERENCES

Ancona, D. G. (1991). The changing role of teams in organizations: Strategies for survival. The International Center for Research on the Management of Technology. Sloan School of Management, Massachusetts Institute of Technology. Working Paper # 37-91.

Argyris, C. (1986). Skilled incompetence. *Harvard Business Review*, September-October 1986:

Argyris, C. (1991). Teaching smart people how to learn. *Harvard Business Review*, May-June 1991: 99-109.

Arney, W. R. & Bergen, B. J. (1984). *Medicine and the management of the living: Taming the last great beast*. Chicago: The University of Chicago Press.

Bakhtin, M. M. (1981). *The dialogic imagination: Four essays by M. M. Bakhtin*. Edited by M. Holquist. Austin: University of Texas Press.

Bakhtin, M. M. (1986). *Speech genres and other late essays*. Austin: University of Texas Press.

Bateson, G. (1972). *Steps to an ecology of mind*. New York: Ballantine Books.

Bateson, G., Jackson, D. D., Haley, J. & Weakland, J. H. (1972). Toward a theory of schizophrenia. In G. Bateson, *Steps to an ecology of mind*. New York: Ballantine Books.

Becker, H. S. (1982). *Art worlds*. Berkeley: University of California Press.

Becker, H. S. (1986). *Doing things together: Selected papers*. Evanston, Ill.: Northwestern University Press.

Beloff, J. S. & Willet, M. (1968). Yale studies in family health care: III. The health care team. *JAMA* 205, 10.

Benner, P. (1984). *From novice to expert: Excellence and power in clinical nursing practice*. Menlo Park, CA: Addison-Wesley.

Bereiter, C. (1985). Toward a solution of the learning paradox. *Review of Educational Research* 55, 201-226.

Bereiter, C. & Scardamalia, M. (in press). Expertise as process.

Bibler, V. S. (1983/84). Thinking as creation: Introduction to the logic of mental dialogue. *Soviet Psychology* XXII, 33-54.

Billig, M. (1987). *Arguing and thinking: A rhetorical approach to social psychology*. Cambridge: Cambridge University Press.

Billig, M. & al. (1988). *Ideological dilemmas: A social psychology of everyday thinking*. London: SAGE.

Bodker, S. & Gronbaek, K. (in press). Cooperative prototyping: Users and designers in mutual activity. *International Journal of Man-Machine Studies*.

Bosk, C. (1980). *Forgive and remember: Managing medical failure*. Chicago: University of Chicago Press.

Bowers, J. & Middleton, D. (1991). Distributed organizational cognition: An innovative idea? Paper presented at the Franco-British Seminar 'Information and Innovation: The Management of Intellectual Resources', Paris, April 1991.

Braverman, H. (1974). *Labor and monopoly capital: The degradation of work in the twentieth century*. New York: Monthly Review Press.

Brehmer, B. (1980). In one word: Not from experience. *Acta Psychologica* 45, 223-241.

Bruce, N. (1980). *Teamwork for preventive care*. Chichester: Research Studies Press.

Callicutt, J. W. & Lecca, P. J. (Eds.) (1983). *Interdisciplinary teams in social work and mental health*. New York: The Free Press.

Charan, R. (1991). How networks reshape organizations - for results. *Harvard Business Review*, September-October, 104-115.

Chase, W. G. & Simon, H. A. (1973). Perception in chess. *Cognitive Psychology* 4, 55-81.

Chi, M. T. H., Glaser, R. & Farr, M. J. (Eds.) (1988). *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.

Cole, R. (1985). The macropolitics of organizational change: A comparative analysis of the spread of small-group activities. *Administrative Science Quarterly* 30, 560-585.

Cole, R. (1989). *Strategies for learning: Small group activities in American, Japanese and Swedish industry*. Berkeley: University of California Press.

Collins, H. M. (1987). Expert systems and the science of knowledge. In W. E. Bijker, T. P. Hughes & T. Pinch (Eds.), *The social construction of technological systems*. Cambridge: The MIT Press.

Collins, H. M. (1990). *Artificial experts: Social knowledge and intelligent machines*. Cambridge: The MIT Press.

Conley, J. M. & O'Barr, W. M. (1990). *Rules versus relationships: The ethnography of legal discourse*. Chicago: The University of Chicago Press.

Coupland, N., Giles, H. & Wiemann, J. M. (Eds.) (1991). *Miscommunication and problematic talk*. Newbury Park: Sage.

Csikszentmihalyi, M. (1988). Motivation and creativity: Toward a synthesis of structural and energistic approaches to cognition. *New Ideas in Psychology* 6, 159-176.

Dewey, J. (1910). *How we think*. Boston: Heath.

Dreyfus, H. & Dreyfus, S. (1986). *Mind over machine: The power of human intuition and expertise in the era of the computer*. Oxford: Basil Blackwell.

Edwards, R. (1979). *Contested terrain*. London: Heinemann.

Ellis, C., Gibbs, S. J. & Rein, G. L. (1991). Groupware: Some issues and experiences. *Communications of the ACM* 34(1), 38-58.

Engeström, Y. (1986). The zone of proximal development as the basic category of educational psychology. *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition* 8:1, 23-42.

Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit Oy.

Engeström, Y. (1989). *Developing thinking at the changing workplace: Toward a redefinition of expertise*. University of California, San Diego. Center for Human Information Processing. Technical Report #130.

Engeström, Y. (1990). *Learning, working and imagining: Twelve studies in activity theory*. Helsinki: Orienta-Konsultit.

Engeström, Y. (1991). Developmental work research: Reconstructing expertise through expansive learning. In M. I. Nurminen & G. R. S. Weir (Eds.), *Human jobs and computer interfaces*. Amsterdam: Elsevier Science Publishers.

Engeström, Y. (forthcoming). *Expertise in transition: Expansive learning in the workplace*. Cambridge: Cambridge University Press.

Engeström, Y. (in press). Developmental studies of work as a testbench of activity theory: Analyzing the work of general practitioners. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context*. Cambridge, Mass.: Cambridge University Press.

Engeström, Y. & al. (1987). Terveyskeskuslääkäreiden työn kehittämistutkimus. LEVIKE-projektin I väliraportti [Developmental study of health center physicians' work. Interim report I of Project LEVIKE]. Espoo: Espoon kaupungin terveysvirasto (in Finnish).

Engeström, Y. & al. (1989). Terveyskeskuslääkäreiden työn kehittämistutkimus. LEVIKE-projektin III väliraportti [Developmental study of health center physicians' work. Interim report III of Project LEVIKE]. Espoo: Espoon kaupungin terveysvirasto (in Finnish).

Engeström, Y. & al. (1990). Terveyskeskuslääkäreiden työn kehittämistutkimus. LEVIKE-projektin II väliraportti: Kunnanlääkäri, terveyskeskuslääkäri, omalääkäri [Developmental study of health center physicians' work. Interim report II of Project LEVIKE: Municipal doctor, health center doctor, personal doctor]. Espoo: Espoon kaupungin terveysvirasto (in Finnish).

Engeström, Y., Brown, K., Engeström, R. & Koistinen, K. (1990). Organizational forgetting: An activity-theoretical perspective. In D. Middleton & D. Edwards (Eds.), *Collective remembering*. London: Sage.

Engeström, Y. & Engeström, R. (1986). Developmental work research: The approach and an application in cleaning work. *Nordisk Pedagogik* 6:1, 2-15.

Engeström, Y., Engeström, R. & Saarelma, O. (1988). Computerized medical records, production pressure and compartmentalization in the work activity of health center physicians. In *Proceedings of the Conference on Computer Supported Collaborative Work*, Sept. 1988, Portland, Oregon.

Engeström, Y., Haavisto, V. & Pihlaja, J. (1992). Alioikeudet uuden työtavan kynnyksellä: Kehittävän työntutkimuksen sovellus tuomioistuinlaitoksessa [Municipal courts facing a new way of working: An application of developmental work research in the court system]. Helsinki: Yliopistopaino (in Finnish).

Erde, E. L. (1982). Logical confusions and moral dilemmas in health care teams and team talk. In G. J. Agich (Ed.), *Responsibility in health care*. Dordrecht: Reidel.

Ericsson, K. A. & Smith, J. (1991). Prospects and limits of the empirical study of expertise: An introduction. In K. A. Ericsson & J. Smith (Eds.), *Toward a general theory of expertise: Prospects and limits*. Cambridge: Cambridge University Press.

Ericsson, K. A. & Smith, J. (Eds.) (1991). *Toward a general theory of expertise: Prospects and limits*. Cambridge: Cambridge University Press.

Fichtner, B. (1984). Co-ordination, co-operation and communication in the formation of theoretical concepts in instruction. In M. Hedegaard, P. Hakkarainen & Y. Engeström (Eds.), *Learning and teaching on a scientific basis: Methodological and epistemological aspects of the activity theory of learning and teaching*. Aarhus: Aarhus Universitet, Psykologisk institut.

Fujimura, J. H. (1988). The molecular biological bandwagon in cancer research: Where social worlds meet. *Social Problems* 35, 261-283.

Gagliardi, P. (Ed.) (1990). *Symbols and artifacts: Views of the corporate landscape*. Berlin: Walter de Gruyter.

Galegher, J., Kraut, R. & Egido, C. (Eds.) (1990). *Intellectual teamwork: Social and technological bases of cooperative work*. Hillsdale: Lawrence Erlbaum.

Gibson, J. L. (1976). Judge's role orientation, attitudes, and decisions: An interactive model. *The American Political Science Review* 72, 911-924.

Glaser, R. (1987). Thoughts on expertise. In C. Schooler & K. W. Schaie (Eds.), *Cognitive functioning and social structure over the life course*. Norwood, NJ: Ablex.

Glaser, R. & Chi, M. T. H. (1988). Overview. In M. T. H. Chi, R. Glaser & M. J. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.

Goffman, E. (1959). *The presentation of self in everyday life*. New York: Doubleday.

Goffman, E. (1974). *Frame analysis: An essay on the organization of experience*. Boston: Northeastern University Press.

Goodwin, C. & Goodwin, M. H. (in press). Formulating planes: Seeing as a situated activity. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work*. Cambridge: Cambridge University Press.

Goodwin, M. H. (1990). *He-said-she-said: Talk as social organization among black children*. Bloomington: Indiana University Press.

Goody, E. N. (Ed.) (1982). *From craft to industry*. Cambridge: Cambridge University Press.

Göranzon, B. & Josefson, I. (Eds.) (1988). *Knowledge, skill and artificial intelligence*. London: Springer-Verlag.

Granström, K. (1986). *Dynamics in meetings: On leadership and followership in ordinary meetings in different organizations*. Linköping: Linköping University, Studies in Arts and Science No. 8.

Greenbaum, J. & Kyng, M. (Eds.) (1991). *Design at work: Cooperative design of computer systems*. Hillsdale: Lawrence Erlbaum.

Greif, I. (Ed.) (1988). *Computer supported cooperative work: A book of readings*. San Mateo: Morgan Kaufman.

Grimshaw, A. D. (Ed.) (1990). *Conflict talk: Sociolinguistic investigations of arguments in conversations*. Cambridge: Cambridge University Press.

Gusfield, J. R. (1981). *The culture of public problems: Drinking-driving and the symbolic order*. Chicago: The University of Chicago Press.

Hackman, J. R. (Ed.) (1990). *Groups that work and those that don't*. San Francisco: Jossey-Bass.

Hales, C. (1989). Management processes, managerial divisions of labour, and managerial work: Towards a synthesis. *Journal of Sociology and Social Policy* 9:5/6, 9-38.

Hamm, R. M. (1988). Clinical intuition and clinical analysis: Expertise and the cognitive continuum. In J. Dowie & A. Elstein (Eds.), *Professional judgment: A reader in clinical decision making*. Cambridge: Cambridge University Press.

Hargrove, E. C. & Glidewell, J. C. (Eds.) (1990). *Impossible jobs in public management*. Lawrence: University Press of Kansas.

Harris, S. (1989). Defendant resistance to power and control in court. In H. Coleman (Ed.), *Working with language: A multidisciplinary consideration of language use in work contexts*. Berlin: Mouton de Gruyter.

- Haskell, T. L. (Ed.) (1984). *The authority of experts: Studies in history and theory*. Bloomington: Indiana University Press.
- Hatano, G. & Inagaki, K. (1983). Two courses of expertise. Paper presented at the Conference on Child Development in Japan and the United States. Stanford, CA.
- Hayes, D. (1989). *Behind the silicon curtain: The seductions of work in a lonely era*. Boston, MA: South End Press.
- Heany, D. F. (1989). *Cutthroat teammates: Achieving effective teamwork among professionals*. Homewood: Dow Jones-Irwin.
- Hendrick, H. W. (1983). Pilot performance under reversed control stick conditions. *Journal of Occupational Psychology* 56, 297-301.
- Heydebrand, W. & Seron, C. (1990). *Rationalizing justice: The political economy of federal district courts*. Albany: State University of New York Press.
- Hildebrand-Nilshon, M. & Rückriem, G. (Eds.) (1989). *Proceedings of the First International Congress on Activity Theory*. Vols. 1-5. Berlin: Hochschule der Künste.
- Hirschhorn, L. (1984). *Beyond mechanization: Work and technology in a postindustrial age*. Cambridge, Mass.: The MIT Press.
- Hogarth, J. (1971). *Sentencing as a human process*. Toronto: University of Toronto Press.
- Holyoak, K. J. (1991). Symbolic connectionism: Toward third-generation theories of expertise. In K. A. Ericsson & J. Smith (Eds.), *Toward a general theory of expertise*. Cambridge: Cambridge University Press.
- Horwitz, J. J. (1970). *Team practice and the specialist*. Springfield: Charles C. Thomas.
- Hughes, E. C. (1951). Mistakes at work. *Canadian Journal of Economics and Political Science* 17, 320-327.
- Hutchins, E. (1988). *Organizing work by evolution and by design*. Paper presented at the conference on Work and Communication, July 1988, San Diego, California.

Hutchins, E. (1990). The technology of team navigation. In J. Galegher, R. E. Kraut & C. Egido (Eds.), *Intellectual teamwork: Social and technological foundations of cooperative work*. Hillsdale, NJ: Lawrence Erlbaum.

Hutchins, E. & Klausen, T. (in press). Distributed cognition in an airline cockpit. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work*. Cambridge: Cambridge University Press.

Imai, K., Nonaka, I. & Takeuchi, H. (1985). Managing the new product development process: How Japanese companies learn and unlearn. In K. B. Clark & al. (Eds.), *The uneasy alliance*. Boston: Harvard Business School Press.

Jacobs, J. B. (1989). *Drunk driving: An American dilemma*. Chicago: The University of Chicago Press.

Janis, I. L. (1985). Counteracting the adverse effects of concurrence-seeking in policy-planning groups: Theory and research perspectives. In H. Brandstatter, J. H. Davis & G. Stocker-Kriechgauer (Eds.), *Group decision making*. London: Academic Press.

Johnson, E. J. (1988). Expertise and decision under uncertainty: Performance and process. In M. T. H. Chi, R. Glaser & M. J. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.

Katz, J. (1984). *The silent world of doctor and patient*. New York: The Free Press.

Kekki, P. (1990). Teamwork in primary care. WHO Regional Office for Europe Document EUR/HFA target 29.

Kling, R. (in press). Cooperation and control in computer supported work. *Communications of the ACM* 34 (special issue on CSCW).

Kling, R. & Iacono, S. (1988). The mobilization of support for computerization: The role of computerization movements. *Social Problems* 35, 226-243.

Laboratory of Comparative Human Cognition (1982). A model system for the study of learning difficulties. *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition* 4:3, 39-66.

Lashof, J. C. (1968). The health care team in the Mile Square Area, Chicago. *Bulletin of the New York Academy of Medicine* 44, 11.

- Latour, B. (1987a). *The Pasteurization of French society*. Cambridge: Harvard University Press.
- Latour, B. (1987b). *Science in action*. Cambridge: Harvard University Press.
- Lave, J. (1988). *Cognition in practice: Mind, mathematics and culture in everyday life*. Cambridge, MA: Cambridge University Press.
- Lave, J. & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press.
- Lawrence, J. A. (1988). Expertise on the bench: Modeling magistrates' judicial decision-making. In M. T. H. Chi, R. Glaser & M. J. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.
- Lecca, P. J. & McNeil, J. S. (Eds.) (1985a). *Interdisciplinary team practice: Issues and trends*. New York: Praeger.
- Lecca, P. J. & McNeil, J. S. (1985b). Issues and trends in team practice. In P. J. Lecca & J. S. McNeil (Eds.), *Interdisciplinary team practice: Issues and trends*. New York: Praeger.
- Leont'ev, A. N. (1978). *Activity, consciousness, and personality*. Englewood Cliffs: Prentice-Hall.
- Leont'ev, A. N. (1981). *Problems of the development of the mind*. Moscow: Progress.
- Levine, J. M. & Moreland, R. L. (1991). Culture and socialization in work groups. In L. B. Resnick, J. M. Levine & S. D. Teasley (Eds.), *Perspectives on socially shared cognition*. Washington, DC: American Psychological Association.
- MacDuffie, J. P. & Krafcik, J. F. (1989). The team concept: Models for change. *The JAMA Forum* 7:3, 3-8.
- Markova, I. (1982). *Paradigms, thought and language*. Chichester: Wiley.
- Markova, I. & Foppa, K. (Eds.) (1990). *The dynamics of dialogue*. New York: Harvester Wheatsheaf.
- McKinlay, J. B. & Stoeckle, J. D. (1987). Corporatization and the social transformation of doctoring. *Sosiaalilaaketieteellinen Aikakauslehti* 24, 73-84.
- McKnight, C. (1981). Subjectivity in sentencing. *Law and Human Behavior* 5, 141-147.

Merry, S. E. (1990). *Getting justice and getting even: Legal consciousness among working-class Americans*. Chicago: The University of Chicago Press.

Middleton, D. & Edwards, D. (Eds.) (1990). *Collective remembering*. London: SAGE.

Middleton, T. & Mackinlay, D. (1987). "Gossip" and "titbits" in teamwork: Conversation as an instrument of multi-disciplinary practice in child-development centres. Paper presented at the international workshop 'Activity, Work and Learning', June 23-26, in Karjaa, Finland.

Mishler, E. G. (1984). *The discourse of medicine: Dialectics of medical interviews*. Norwood: Ablex.

Nelson, K. (1981). Social cognition in a script framework. In J. Flavell & L. Ross (Eds.), *Social cognitive development*. New York: Cambridge University Press.

Nelson, K. (1985). *Making sense: The acquisition of shared meaning*. Orlando: Academic Press.

Newell, A. & Simon, H. A. (1972). *Human problem solving*. Englewood Cliffs, NJ: Prentice-Hall.

Norman, D. A. (1982). *Learning and memory*. San Francisco: Freeman.

Nyíri, J. C. & Smith, B. (Eds.) (1988). *Practical knowledge: Outlines of a theory of traditions and skills*. London: Croom Helm.

O'Barr, W. M. (1982). *Linguistic evidence: Language, power, and strategy in the courtroom*. New York: Academic Press.

Parker, A. W. (1972). *The team approach to primary health care*. Berkeley: University of California, Berkeley, University Extension.

Parker, M. & Slaughter, J. (1988). *Choosing sides: Unions and the team concept*. Boston: South End Press.

Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. New York: Basic Books.

Philips, S. U. (1990). The judge as third party in American trial court conflict talk. In A. D. Grimshaw (Ed.), *Conflict talk: Sociolinguistic investigations of arguments in conversations*. Cambridge: Cambridge University Press.

Posner, M. I. (1988). Introduction: What is it to be an expert? In M. T. H. Chi, R. Glaser & M. J. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.

Powell, W. W. (1990). Neither market nor hierarchy: Network forms of organization. In B. M. Staw & L. L. Cummings (Eds.), *Research in organizational behavior*. Vol. 12. Greenwich: JAI Press.

Pucik, V. (1988). Strategic alliances with the Japanese: Implications for human resource management. In F. Contractor & P. Lorange (Eds.), *Cooperative strategies in international business*. Lexington: Lexington Books.

Raeithel, A. (1983). *Tätigkeit, Arbeit und Praxis*. Frankfurt am Main: Campus.

Raeithel, A. (in press). Activity theory as a foundation for design. In R. Budde, C. Floyd, R. Keil-Slawik & H. Züllighoven (Eds.), *Software development and reality construction*. Berlin: Springer.

Reason, J. (1990). *Human error*. Cambridge: Cambridge University Press.

Resnick, L. B., Levine, J. M. & Teasley, S. D. (Eds.) (1991). *Perspectives on socially shared cognition*. Washington, DC: American Psychological Association.

Riemer, J. (1976). Hard hats' mistakes at work: The social organization of error in building construction work. *Social Problems* 23, 255-267.

Rittenberg, W. (1985). Mary: A patient as emergent symbol on a pediatrics ward: The objectification of meaning in social process. In R. A. Hahn & A. D. Gaines (Eds.), *Physicians of western medicine*. Dordrecht: Reidel.

Rorabaugh, W. J. (1986). *The craft apprentice: From Franklin to the machine age in America*. New York: Oxford University Press.

Rosow, J. (Ed.) (1986). *Teamwork: Joint labor-management programs in America*. New York: Pergamon Press.

Ross, H. L. (1991). Suomen uudestisyntynyt rattijuoppousongelma [Finland's drunk driving problem reborn]. In T. Peltoniemi (Ed.), *Moni ottaa ja ajaa* [Many drink and drive]. Helsinki: VAPK-kustannus (in Finnish).

Schank, R. & Abelson, R. (1977). *Scripts, plans, goals, and understanding*. Hillsdale: Lawrence Erlbaum.

Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. London: Temple Smith.

Schwartzman, H. B. (1987). The significance of meetings in an American mental health center. *American Ethnologist* 14, 271-294.

Schwartzman, H. B. (1989). *The meeting: Gatherings in organizations and communities*. New York: Plenum Press.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday.

Seron, C. (1990). The impact of court organization on litigation. *Law and Society Review* 24, 451-465.

Silverman, D. & Torode, B. (1980). *The material word: Some theories of language and its limits*. London: Routledge & Kegan Paul.

Simon, D. P. & Simon, H. A. (1978). Individual differences in solving physics problems. In R. Siegler (Ed.), *Children's thinking: What develops?* Hillsdale, NJ: Lawrence Erlbaum.

Star, S. L. (in press). Working together: Symbolic interactionism, activity theory and distributed artificial intelligence. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work*. Cambridge: Cambridge University Press.

Suchman, L. (in press). Constituting shared workspaces. In Y. Engeström & D. Middleton (Eds.), *Cognition and communication at work*. Cambridge: Cambridge University Press.

Tichy, N. M. (1977). *Organization design for primary care: The case of the Dr. Martin Luther King, Jr. Health Center*. New York: Praeger.

Todorov, T. (1984). *Mikhail Bakhtin: The dialogical principle*. Manchester: Manchester University Press.

Tuckett, D. & al. (1985). *Meetings between experts: An approach to sharing ideas in medical consultations*. London: Tavistock.

Turner, B. A. (1978). *Man-made disaster*. London: Wykeham.

Virkkunen, J. (1991). Toward transforming structures of communication in work: The case of Finnish labor protection inspectors. *The Quarterly Newsletter of the Laboratory of Comparative Human Cognition* 13:4, 97-107.

- Volosinov, V. N. (1971). Reported speech. In L. Matejka & K. Pomorska (Eds.), *Readings in Russian Poetics: Formalist and structuralist views*. Cambridge: The M.I.T. Press.
- Voss, J. F. & Post, T. A. (1988). On the solving of ill-structured problems. In M. T. H. Chi, R. Glaser & M. J. Farr (Eds.), *The nature of expertise*. Hillsdale, NJ: Lawrence Erlbaum.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Walker, A. G. (1986). The verbatim record: The myth and the reality. In S. Fisher & A. D. Todd (Eds.), *Discourse and institutional authority: Medicine, education, and law*. Norwood: Ablex.
- Weick, K. E. (1979). *The social psychology of organizing*. New York: Random House.
- Wertsch, J. V. (Ed.) (1981). *The concept of activity in Soviet psychology*. White Plains, NY: Sharpe.
- Wertsch, J. V. (1990). The dialect of rationality in a sociocultural approach to mind. In L. C. Moll (Ed.), *Vygotsky and education: Instructional implications and applications of sociohistorical psychology*. Cambridge: Cambridge University Press.
- Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge: Harvard University Press.
- West, C. (1984). *Routine complications: Troubles with talk between doctors and patients*. Bloomington: Indiana University Press.
- Whalen, J., Zimmerman, D. H. & Whalen, M. R. (1988). When words fail: A single case analysis. *Social Problems* 35, 335-362.
- Womack, J. P., Jones, D. T. & Roos, D. (1990). *The machine that changed the world*. New York: Rawson.
- Yngvesson, B. & Mather, L. (1983). Courts, moots, and the disputing process. In K. Boyum & L. Mather (Eds.), *Empirical theories about courts*. New York: Longman.
- Zald, M. & Berger, M. (1978). Social movements in organizations: Coup d'etat, insurgency, and mass movements. *American Journal of Sociology* 83, 823-861.

Zuboff, S. (1988). *In the age of the smart machine: The future of work and power*. New York: Basic Books.

Research Bulletin, Department of Education, University of Helsinki
Head: Erkki A. Niskanen, Professor of Education
Bulevardi 18, SF-00120 Helsinki, Finland

- No. 52 The Ability to Structure Acoustic Material as a Measure of Musical Aptitude. 5. Summary and Conclusions by KAI KARMA. March, 1980. 33 pp.
- xNo. 53 The Electronic Hand Calculator in Finnish Comprehensive School Mathematics Teaching by JOHANNES PAASONEN. Oct., 1980. 50 pp.
- xNo. 54 Learning Process in Terms of Styles and Strategies: Theoretical Background and Pilot Study by ANNA-LIISA LEINO. Dec., 1980. 40 pp.
- xNo. 55 Emotion and Cognition in Visual Art Education by INKERI SAVA. March, 1981. 46 pp.
- No. 56 Classroom Analysis: Concepts, Findings, Applications. DPA Helsinki Investigations III edited by ERKKI KOMULAINEN and PERTTI KANSANEN. May 1981. 52 pp.
- xNo. 57 Psychometric Test Theory and Cognitive Processes: A Theoretical Scrutiny and Empirical Research by JARKKO LEINO. October 1981. 74 pp.
- No. 58 On the Dynamics of Undergraduate Performance and Dropout by KAJ MALM. April, 1982. 14 pp.
- xNo. 59 Learning Process in Terms of Styles and Strategies: Case Studies by ANNA-LIISA LEINO. May, 1982. 51 pp.
- No. 60 Research Project on Educational Aims by ERKKI A. NISKANEN & al. June, 1982. 105 pp.
- No. 61 Admission to Teacher Education and Two Cognitive Styles by ANNA-LIISA LEINO — ARJA PUURULA. June, 1983. 54 pp.

Head: Anna-Liisa Leino, Professor of Education (Swedish)

- No. 62 The Helsinki Test. The Inkblots and Using the Test by KARL BRUHN. October, 1984. 49 pp.
- No. 63 Realization of Didactic Principles in Foreign Language Teaching in Soviet Schools by LYYLI RONKONEN. November, 1984. 30 pp.
- No. 64 An Exploration of the Interpersonal Relationships, Health-Related Behavior and Physical and Mental Health of Finnish University Students by Vello Serrat. October, 1986. 29 pp.
- No. 65 The Meaning of Life among Secondary School Pupils. A Theoretical Framework and Some Initial Results by HÄNNELE NIEMI. January, 1987. 81 pp.
- No. 66 Some Principal Results of the Studies Carried out in the Research Project on Instructional Material by VESA A NISKANEN. October, 1987. 27 pp.
- No. 67 Assessing Foreign Language Training Needs of Adults. A case study from Finland by KAARINA YLI-RENKO. April, 1988. 90 pp.
- xNo. 68 Knowledge in Interactive Practice Disciplines. An analysis of knowledge in education and health care by ANNELI SARVIMÄKI. October, 1988. 276 pp.
- xNo. 69 Intercultural Communication as an Aim of English Language Teaching by KAARINA YLI-RENKO. December, 1988. 45 pp.
- xNo. 70 Integrating Information in Conceptual Models. Use of an information structure in building conceptual models for behavioural studies by SEPPO KONTIAINEN. January 1989. 59 pp.
- No. 71 Theoretical Background and Development of Instructional Materials by JARKKO LEINO. April 1989. 25 pp.
- No. 72 A Study of Learning Styles by ANNA-LIISA LEINO, JARKKO LEINO and JUHA P. LINDSTEDT. August 1989. 68 pp.
- No. 73 Nonverbal Intelligence and Foreign Language Learning by IRENE KRISTIANSEN. May 1990. 164 pp.
- No. 74 Pluralism and Education in Values by TAPIO PUOLIMATKA. October 1990. 31 pp.
- No. 75 Personality as an Educational Phenomenon by ERKKI A. NISKANEN. October 1990. 44 pp.
- No. 76 Describing Personality Utilizing the Theory of Fuzzy Systems by VESA A NISKANEN. October 1990. 16 pp.

- No. 77 Modeling System Operators Affecting the Information Organizer of an Individual by RAIMO LAASONEN. May 1991. 104 pp.
- No. 78 Use of Conceptual Models in Case Studies. Dynamic Concept Analysis by SEPPO KONTIAINEN. Applications in collaboration with Klaus Helkama, Peter Herriot, John Hobrough, Jyri Manninen, John Roscoe and Malcolm Tight. June 1991. 237 pp.
- No. 79 Dynamic Knowledge in School. An Action Research on Instructional Development with the Aid of Microcomputers by JARKKO LEINO. December 1991. 116 pp.
- No. 80 Self-Identification of Personality in Social Environment by RAIMO LAASONEN. December 1991. 20 pp.

Head: Karl E. Nurmi, Docent

- No. 81 Predictors of Critical Thinking Abilities. A Rasch-Model Approach by PERTTI V.J. YLI-LUOMA. March 1992. 142 pp.
- No. 82 Foreign Language Learning and Nonlearning by IRENE KRISTIANSEN. April 1992. 189 pp.
- No. 83 Interactive Expertise: Studies in Distributed Working Intelligence by YRJÖ ENGELSTRÖM. May 1992. 105 pp.

x) Out of print.

ISBN 951-45-6146-5
ISSN 0359-5749
Helsinki 1992
Yliopistopaino